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JPRS-UST-88-010
23 SEPTEMBER 1988



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JPRS Report

Science & Technology

***USSR: Science &
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Science & Technology

USSR: Science & Technology Policy

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Gorbachev Meeting at Physics Institute in Krasnoyarsk

TV Reports Meeting

*18140502 Moscow Television Service in Russian
1400 GMT 13 Sep 88*

[From the "Vremya" newscast; report by unidentified correspondent on 13 September meeting with Mikhail Sergeyevich Gorbachev and the Krasnoyarsk Kray leaders, representatives of ministries and departments, and scientists at the Physics Institute of the Siberian Department of the USSR Academy of Sciences]

[Text] [Begin recording] [Gorbachev] Comrades, we are worried about how things are going in Krasnoyarsk Kray. Increasingly frequently the topic of developing the productive forces in Krasnoyarsk Kray is the focus of various conferences and sessions at the Politburo, the government, Gosplan, the State Committee for Construction, and other central departments of our country.

So that's how it is. If we add here, comrades, that during the last couple of years so many letters have been received from Krasnoyarsk Kray, from its working people, on a very wide circle of questions concerning people's lives and the solution of national economic tasks, then taking all this together, it generally worries us.

Look at what is happening, at the amounts of capital investment which has been sent here—enormous amounts, billions. No one receives greater capital investment than Krasnoyarsk Kray—of the oblasts, I mean.

One would think that a reasonable approach could be organized on that basis. After all, the process of shaping up is in progress, the beginning has been made, it seems. Territorial complexes, there are academies, there is a department where work was being done on the projects. The scientific approach was supposed to be used as the basis, but what has been going on, what happened to that scientific approach? Who is to blame, who has ruined it? In what...[changes thought] At which managerial stage was it buried, if the approaches to assimilating this kray's production forces have been worked out thoroughly, if the questions of a gap in the rates of construction of production facilities and infrastructure in, above all, the social one, have arisen? If the question of developing and building up capacities, and the question of resolving ecological issues has been posed; if the question has arisen of... [changes thought] The issue of using the hydrotechnical resources has become controversial, in connection with the fact that the ecology has worsened and tracts of land have also been going.

Where are those scientific solutions, the projects that promised that everything would be fine, when we raised one power station after another here—and look how many problems we now have on our hands. The people

are aware of that, they are very concerned with this whole situation, and you who live here probably feel that the people do not want to put up with it any more.

Let us have it straight. Now it is appropriate as never before; we have created conditions for that, through glasnost, through creating a certain atmosphere to enable a person to express his position, to voice his point of view. This is precisely what we should have in our society. After all, our society is called that of working people. Then the working person should be the chief dramatis persona in this society. It amounts to ... [changes thought] I mean not only those who occupy some posts or enjoy some distinction owing to their scientific competence, but also those who do their work on the land, on rivers, on factories, and in mines, etc.

Now, as it has become possible, people appear to have amassed a great deal of things to say to both the local bodies here and in the center. That is why, as I was leaving for here, I was thinking that I should meet without fail with the scientists and the economy leaders, with the participation of ministers representing the USSR Government, ministers—the RSFSR's government is also here, represented by Comrade Yerminev.

On the whole, comrades, the matter is serious. One must get to the bottom of it. After all, generally speaking, we must develop this kray's productive forces. But if they are developed as they are being developed today, this means pouring down the drain billions more of funds and creating an altogether intolerable situation here. Is that really how we are to build? After all, all these building sites were called building sites of communism, if I remember correctly.

Yes. Is that really how building sites under the flag of communism should be conducting their affairs? When both nature is under threat and man's interests find themselves somewhere way down the line at the lowest level, that won't work, and it cannot work, and it is not working now. Let us, indeed, be objective. [end recording]

[Correspondent] Then an address was made by Abakumov, first deputy chairman of the krayispolkom and head of the chief Planning and Finance Directorate. He sketched today's situation concisely and highlighted the following conclusion: Over 70 ministries whose enterprises are located in the kray are tackling the vital problems of comprehensive development in a purely narrow departmental way, while the local authorities have been taking life easy for decades.

[Begin recording] [Abakumov] In this way [words indistinct] the running of the economy [words indistinct] party bodies. Despite certain costs, even substantial ones, the kray has been developing dynamically for over 2 decades now and has been progressively building up its economic, social and cultural potential. The development programs approved by the decisions of the CPSU

Central Committee and the USSR Council of Ministers played a decisive role in this. We have convincing reasons to request support for our proposal to adopt for the 13th and 14th 5-Year-Plan periods a decision by the CPSU Central Committee and the USSR Council of Ministers on the main areas for development. That is to say, not in general, but for specific areas of development; that is to say, for bringing the kray into a state of balance.

A region which holds 50 percent of the country's total coal reserves, 20 percent of its timber and hydroelectric resources, which produces a considerable volume of nonferrous metallurgy, and which today yields over 1 metric ton per person, is working off its debt to the state, and is working for the benefit of the people living in our territory.

[Gorbachev] Yuriy Konstantinovich, how come in your region the nonproduction sector's share of capital investments stands at around 23 percent?

[Abakumov] It is 23 percent.

[Gorbachev] It is over 23 percent, but it was 19-20 percent. What was the krayispolkom doing, generally speaking?

[Abakumov] Well, the krayispolkom was waging battle, Mikhail Sergeyevich, in this very field. So, I will now quote you...

[Gorbachev, interrupting] There has not been a single person doing battle and not a single fatality. No result. [laughter] What kind of battle do you call this? And you lost completely. We cannot allow such a thing, such a situation, when a region is at the stage of maximum opening and development. These areas must not be pushed into the background when the people must be accommodated. How did this come about?

[Abakumov] Mikhail Sergeyevich, I will answer you gladly.

[Gorbachev] So from today onward do not give any minister anything; do not give them an inch; give them a hard time. Many of them are living here. [Gorbachev gestures to auditorium] Let then wriggle out of it as best they can.

[Abakumov] Not giving to the minister now means not giving to the state. Here we also [words indistinct] Mikhail Sergeyevich, I can explain.

[Gorbachev] No, I tell you, if we do not improve things dramatically the state will not get anything because the development of productive forces will grind to a halt. This is what I am driving at, the most important thing.

If things develop along the lines which are already taking shape, that means stultifying the development of the economy, a gap between industrial and social construction, and lagging behind and failing to address and resolve ecological issues. Well, how can one develop on such principles; that is when you strike a blow against the interests of the state. No one will get anywhere, generalizing about this. We cannot develop further on such principles. In connection with this, it is clear that at the time you were probably not working in the krayispolkom?

[Abakumov] I have been working there for 5 years, that's enough, Mikhail Sergeyevich.

[Gorbachev] That is something, indeed. But the question is, what are the prospects for the 13th 5-year period. You have expounded these, if you summarize them, what proportion will go to the non-production sphere approximately?

[Abakumov] Mikhail Sergeyevich, as regards the rate at which we are working on this matter, every year we make forecasts. This year we also made our forecast. For 1987-88 our forecast was for 28 percent; we achieved 24 percent. This year, our forecast is about 30 percent.

[Gorbachev] You said that there are long-term ecological issues.

[Abakumov] Yes.

[Gorbachev] How are you going to resolve these ecological tasks while further developing production levels. Can you not formulate some sort of program right now of urgent measures to be recorded directly with the government so that, so to speak, every minister and every department signs it and then solves it? One must be tough. I can sense that there is no need to talk to people about this now. Wherever I have been, in the street, in the factory, and even here in the entrance to your building when we were approaching, Vladimir Ivanovich, people simply take you by the throat, and I think that's right, too. Cannot these lists of specific measures be gathered together into a current, rigorous program planned over 2 or 3 or even 4 years to clear everything up?

[Abakumov] That's possible, Mikhail Sergeyevich.

[Gorbachev] So things can be put right.

[Abakumov] We shall indeed make such proposals.

[Gorbachev] Do, then. Why is it that on the Yenisey and other rivers people everywhere say they have no water at home?

[Abakumov] No water at home?

[Gorbachev] Yes. Yesterday and today all round Krasnoyarsk, you know, people were saying...

[Abakumov, interrupting] That was at Yemelyanovo, wasn't it?

[Gorbachev] Yemelyanovskiy Rayon, and (Nikolayevka) here, and some other regions as well.

[Unidentified speaker] The housing estates of (Shvey-nikov) and (Leninskiy) rayon, those issues were also raised.

[Abakumov] Well, it's something to do with the municipal services. One must know the details in each place you see, Mikhail Sergeyevich, but we'll sort it out. You were saying that there is no water in Krasnoyarsk. Well, we have imbalances in common construction too; there is lagging behind there too; there are problems there too. But I would have to know what the problem is specifically to be able to give a specific answer.

[Gorbachev] Well, okay. [end recording]

Comments on 'Mismanagement'

18140502 Moscow Television Service in Russian
1400 GMT 13 Sep 88

[From the "Vremya" newscast]

[Text] [Announcer] As has already been reported, Mikhail Sergeyevich Gorbachev met today in Krasnoyarsk with scientists from the Academy of Sciences Siberian Department. Comrade Gorbachev summed up the results of that meeting in his concluding speech. We have just received a recording of his address.

[Begin recording] [Gorbachev] Well, we have spent 4 hours together but I think our conversation has only just begun to get going. It must be continued, comrades. I will try to quickly finish this meeting, this conversation, because the conversation should be continued and it should finish by moving on to practical solutions.

Well, first of all, today's meeting, conversation, and the speeches by the comrades here—first the reports and then the speeches by the comrades—corroborate the assessment which alarmed the Central Committee and the government about the situation in Krasnoyarsk Kray. Moreover, I think that if we were to examine the problems more deeply, in more detail, then things would be discovered which would arouse simple indignation and, most importantly, distress. Much has been buried in the Krasnoyarsk earth which is not functioning, which is lying moribund. Generally speaking, this is what is known as mismanagement. I will tell you bluntly that it is both the center that is responsible for this mismanagement, since the ideology of planning and deployment of productive forces lies behind it, as well as the departments which have not been equal to the standard—and here we mean the state standard—and which have been the captives of their own departmental positions.

This is no good at all—I have already cited these figures—the Power Engineering Ministry and the Coal Industry Ministry, which have interests, so to speak, on a nationwide scale, in developing and creating a base and embarking on operations on such a scale, envisioned allocating capital investments amounting to only 18 percent to the nonproductive sphere. This is not borne out by any planning, neither by scientific planning nor by planning on the basis of simple economic calculation, a rough estimate. It is clear without any science here that this is a total distortion, a deformation of investment policy. Departmentalism is contributing to this.

I must say bluntly that to some extent the Krasnoyarsk Kraykom, the kray ispolkom, and all the economic planners who operate here have also been unable to withstand this departmental pressure and put up against it the interests of the territory, the comprehensive interests, a comprehensive approach. Yet only a comprehensive approach is justified and can exist when events take such turns as these.

And perhaps science too, it must be said. Guriy Ivanovich, when you were here, and Comrade Koptug failed to speak out and take a firm position, a sharp position, quite simply. [sentence as heard] You know what sort of position that is; science, you know, is an independent judgment, it is scientifically based and it must stand up straight and must come in at any state level, if what is necessary is not done. This, I have to say, you must also take to heart so that we can all draw lessons from this first epic stage in the development of the productive forces of Krasnoyarsk Kray.

That is the first thing. The second is this: Just look at what kind of problems have piled up. A fine thing! What a turnabout has happened here with work on this rich, simply beautiful land! Work has been done but it loses its value because it has been done, you know, not solicitously but in a self-seeking way, as though some kind of colonizers had come here for a single year to extort all the resources and take them off somewhere, and in the end you will not even be able to grow grass there anymore!

But, comrades, we have come here for centuries. Surely that is not the way to go about things! As a result, it is as though much has been done. Frankly, the potential is such that it enables us to look firmly into the future, relying on it for support on a large scale. On the other hand, the national economy has not received the due results, not from science or from investments, and in all areas, at that, in all areas of the kray's national economy.

But the main thing is this: Just look how this affected the people. In housing the questions are acute ones, with food the question is an acute one, and look at ecology, how acute it has become. All this, like today's conversation, has shown that all these are solvable problems, solvable problems, comrades. It is not that I have missed the end of the whole discussion and, perhaps, the whole analysis. I can see that there are no insurmountable

problems here; they can be solved. I believe the approach here should be the following: There are problems which need to be thoroughly studied and thoroughly worked out further, and then they should be included in the 13th 5-Year-Plan and in the long term right up to the year 2005—we have gone that far, that is.

But there are issues which stand out here and we have agreed already that they can be singled out, those for the next 2 or 3 years, in order to achieve a drastic improvement. The agro-industrial complex, all of those proposals, should be discussed straight away. Comrade Veprev should be taken as the basis for that approach. This also agrees with our current approaches, with how we generally shape it up and put the finishing touches to it, more or less; nothing ever ends, nevertheless [we must continue]. This is for the next plenum which will be devoted to issues of agrarian policies, but you need it right now.

The Krasnoyarsk Kray is capable of feeding others besides itself, not only itself. To say nothing of the vast potential alongside it. All the issues should be removed. This should be thought out. You should keep making proposals of the kind which you and I have agreed on, but taking into account today's conversation, I believe that amendments are necessary, they are necessary. This is the first thing.

As far as housing is concerned, go ahead, Yuriy Petrovich. The things you have spoken of, what the kray has in mind here and what departments have in mind, tabulate it all in a program that will take us to 1991, right? The 1 million target?

[Unidentified man] Right, that is what is needed.

[Gorbachev] By 1991, 1 million square meters per annum. What about now, 600?

[Man] No, over a million.

[Gorbachev] Over a million. What about now?

[Man] Now we do 530 in Krasnoyarsk, and 2,102 in the kray as a whole.

[Gorbachev] A hundred at a time, then you should reach 3.

[Man] Ah, 3 should be reached.

[Gorbachev] Here, 3 million, as a matter of fact. A feasible task, it appears that it is possible. But again, all should take part, above all, regarding equipping new construction enterprises, etc.

Finally, there is ecology. There are top priority things and there are things which science is expected to do. I must say that we are not satisfied with science here. Guriy Ivanovich, everything must be looked into. Those coals, all those technological things for Norilsk, for the

aluminum, for the entire nonferrous metallurgy, for—let us put it bluntly—hydroelectric power stations. Today this subject has not figured prominently, but it has exactly the same ring to it as all other subjects which have been named. I mean the question of what should be done about hydroelectric power stations. Incidentally, the scientists here did pose this question in the runup. We must look into it.

No. Someone asked a question. Was it you? Yes, yes, yes. It must be seen through to the end. Comrades, it is not that hydroengineering is a wrong direction. No, no. It is simply that hydroengineering must harmonize with nature conservation and with other industries, because there, too, there are departmental interests in making the hydrostation projects cheaper. Work on conserving, on restoring, and on other things—I will not list them now—has been excluded, and by making a project cheaper, a departmental project, they damage what accompanies it and, first and foremost, nature. This, you see, is what we must get rid of. This is what we must get rid of, regardless of the fact that the whole world is building.

If we say that have used our potential water resources by 20 percent while other countries have used theirs by 40, 60 or 70 percent, then we must look and see whether we need such huge complexes as Krasnoyarsk and Sayano-Shushenskoye or whether there should be convenient power stations where the natural course of rivers is used without changing anything. We must look at that, for there already are such ones in our country—cascades of small stations which unite and feed the electricity grid. This all takes place normally and everything goes on living. Nothing is disturbed. Even the little streams go on living. It is gigantomania again, you know, and these floods and overflows have all led again to questions arising. So, this question can be resolved too. A list must be drawn up directly of all urgent minimum programs regarding ecological questions. People must be made aware after all that these urgent programs have been drawn up: on food, housing, and ecology.

Now I would like to end the business section of this conversation: In general, we understand that Krasnoyarsk Kray needs support. Support. The country has great interests here, but Krasnoyarsk Kray needs support from the center.

We will try to bear this in mind when completing this 5-year plan and especially when drawing up plans for the future, when we prepare the 13th 5-Year Plan.

On the whole, comrades, let us agree on the following: Do not wait for instructions. The main instructions have been given. The points of departure have been given. The political requisites exist, the economic prerequisites now exist for this. A certain atmosphere has been created. The potential of each organization must now be developed thoroughly. Workers are now talking a very great deal about the fact that the cadres are not in a

hurry, that they are taking a long time to get moving. The problems are piling up whereas the bosses are still continuing to hold meetings.

Perhaps our conference, too, if it does not result in change, will also be called one of those conferences, you understand, only already at a high level. It will simply be a scandal if after our conversation nothing substantial happens here and in the center. I think that we must not permit this. Things must be resolutely improved. I think that in the Politburo we will issue political instructions, directives to everyone. So that is it. Well, good-bye! [end recording]

Discussions Reported

18140502 Moscow Television Service in Russian
1700 GMT 13 Sep 88

[From the "Vremya" newscast; announcer-read report with video recorded portions of CPSU General Secretary Mikhail Gorbachev's 13 September meeting in Krasnoyarsk with members of the Siberian Department of the USSR Academy of Sciences]

[Text] [Announcer] A meeting took place today in Krasnoyarsk between Mikhail Sergeyevich Gorbachev and scientists of the Siberian Department of the Academy of Sciences. Academician Koptug, chairman of the Siberian Department of the Academy of Sciences, spoke about the structure of the Krasnoyarsk Science Center and about its institute's developments, and in particular about reversible magneto-optic discs created in the Institute of Physics, where this meeting took place.

[Begin recording] [Koptug] It will be easy to see in this development the strong and weak sides of the Krasnoyarsk Science Center. The strong side is the deep level of fundamental research; the weak side is the absence of a practical—in modern terms—design and experimental production base which is holding back the advancement here of our national economic developments.

[Gorbachev] Nikolay Aleksandrovich Surin, corresponding-member of the V.I. Lenin Academy of Agricultural Sciences and director of the Krasnoyarsk Agricultural Research Institute, weren't you there when I chatted at the entrance?

[Surin] No.

[Gorbachev] No? I will ask you the question they asked me. They asked the Central Committee and the government to solve the question of food supplies for Krasnoyarsk Kray and the city of Krasnoyarsk. And I told them this: You know what, dear comrades, people of Krasnoyarsk; in the country on average each person gets 0.75 hectares of plowland, whereas you get 1 and 1/2 or even 2 times as much.

[Surin] Yes.

[Gorbachev] Therefore, no one will solve this food problem on your behalf. What's more, you as a scientist are asking the question. This land must be utilized. We have begun to bring up the subject of Siberia. Well, your ancestors and forefathers lived in Siberia. So, the people of Siberia in the past—and I want to talk about this in my meeting with the working people—brought their produce to the center, to the Urals and to the center, and marketed it. And despite the transportation cost, it was so competitive that at the Chelyabinsk exchange they put such a duty on it that it couldn't get through. And now you have to import foodstuffs. This is an introduction to your report, so you won't beat around the bush but will answer the question: how to solve specifically—and you can do it quicker than anywhere else—this problem. Tell me, did it not happen during the great developments in the work of Krasnoyarsk Kray's productive forces that the agrarian sector took a back seat to some extent? Your attention, please. [end recording]

[Announcer] Over these 2 days the people of Krasnoyarsk have been speaking most of all about poor supplies of local produce. The director of the scientific research institute spoke among other things in his speech, if one may call it that, about the increase in the kray's stock-breeding production in recent years.

[Begin recording] [Unidentified director] Consumption per head of meat products has increased from 61 kgs in 1983 to 67 kgs in 1987; dairy products...

[Gorbachev, interrupting] You (?think so), eh?

[Director] Milk...

[Gorbachev, interrupting] By how many grams are you stretching the elastic here with scientific jargon, how much has it increased, by 6 kg?

[Director] Yes, by 6 kg.

[Gorbachev] In other words...

[Director, interrupting] Very little. Milk [production] has increased from 348 kg to 360 kg. Production of eggs and potatoes has been brought up to rational norms.

[Gorbachev] I am rather embarrassed even to say, when talking to people, that Krasnoyarsk consumes rational norms of meat. They just laugh at our national norms. And it is written into our food program: 70 kg of meat—well, Krasnoyarsk consumes 71 kg, 71 kg of meat. And how much fish, 18 kg?

[Director] Yes.

[Gorbachev] So, that means 88 kg of meat and fish: 88. In Japan...

[Director, interrupting] Thirty kg of meat.

[Gorbachev] Of meat, and 46 of fish?

[Director] Yes, about that.

[Unidentified woman] And the Chinese 18 kg.

[Gorbachev] The Chinese 18 kg of meat, and still anyone who travels there says it's always in the shops unsold. What a fine kettle of fish! What sort of rational norm is that, Comrade Surin? Our people are laughing at these scientifically based norms.

[Director] At the same time, Mikhail Sergeyevich, we understand that, of course, the socioeconomic effect is a result involving many factors. We have not been able to create a proportionally balanced agro-industrial complex, as we have not been able to balance all factors in our agriculture.

[Gorbachev] Well, we have listened to reports and perhaps now I would like to ask a few comrades to speak. Perhaps someone would like to take the floor before the ministers take over, and you can sit down, and I'll also want to take the floor. Well, something from the managers, please. [end recording]

[Announcer] The following went on to speak at the meeting: (?Nakalyakov), general director of the Krasnoyarsk Geologiya Association; Academician Trofimuk; (Sayenko), head of Krasnoyarskstroy; and (Veprin), Arkadiy Filimonovich, one of the country's most well-known rural managers, director of the Nazarovskiy Sovkhoz.

[Begin recording] [Gorbachev] Arkadiy Filimonovich, Comrade (Veprin), please. So you cannot walk around in Krasnoyarsk, eh?

[Veprin] Why?

[Gorbachev] Well, they ask about food all the time. Isn't it a fact that people live quite well in the countryside, and they don't think about how difficult it is in the towns to develop such a kray, in difficult...[changes thought] They don't think much about industry. (?You could even say): The bosses don't think, the farm workers don't think, no one thinks...

[Veprin, interrupting] It's not convenient to go around the shops.

[Gorbachev] Well, what is it?

[Veprin] Mikhail Sergeyevich, I believe that what you have seen is not the whole problem. It is half of the problem. I believe that there is a far more serious question with agriculture, with providing produce to the population of Krasnoyarsk Kray—a far more serious question—because agriculture has been brought to the brink in Krasnoyarsk Kray. Sovkhozes like ours and

even the ones close to it are units which so far have no great prospects. In the final analysis, can Krasnoyarsk Kray be fed? That's the question as I understand it.

[Gorbachev] Precisely.

[Veprin] If we can't feed Krasnoyarsk Kray, then we won't resolve anything properly in the kray with any restructuring. First of all, we must feed people and perhaps give them a certain choice. Mikhail Sergeyevich, over these years the people have lost the right to property. This is a general truth. It is very clear to me (?in my work here). The people treat everything as though it is the state's affair. Seventy years of Soviet power, and when you go to a farm there is a state cow, if you go into a house it's the state's house. The state's house is not your own house. That is, there have been changes in production relations. I believe this a very correct question, Mikhail Sergeyevich. You are its initiator in practice. You raised this question in Kursk and Belgorod.

[Gorbachev] Were you there then?

[Veprin] No, I was at a resort. I was following it very closely. I wasn't invited there. So all forms of leasing—collective, individual, collective contract, lease contract—are of course the way toward (?reestablishing) agriculture. But I think, Mikhail Sergeyevich, that this is not the whole way, that it will not solve the issue.

[Gorbachev] And social conditions in the countryside?

[Veprin] Mikhail Sergeyevich, the question must be raised of going over to the family farm, the family farm.

[Gorbachev] Of going further?

[Veprin] We must go further. Tell me please. Show me someone who has not relied on handouts from above, and developed agricultural production in several areas of our kray where salaries are paid that are double the rate of production.

[Gorbachev] Yes.

[Veprin] For only we can act like that and spoil ourselves.

[Gorbachev] And I wonder why that economic planner and, beside him, sovkhoz or kholkhoz workers should attempt to reach the level of the indicators of the sovkhoz headed by Comrade (Veprin) if their salaries, with these indicators, with all the unprofitability, are the same or even higher, and if the state is even allocating money so they can build at the expense of...

[Veprin, interrupting] And people above us are summing up results to the effect that we, nonetheless, we have managed to pull this farm through the year. Mikhail Sergeyevich, I think we must give up gradualism. We

must throw away the saying, and perhaps it has been rejected before, that the Russian peasant spends a long time harnessing but travels quickly.

[Gorbachev] I will ask you a direct question. There was one time when we did work fast and continuously, in 1929 to 1933, and we are still trying to untangle ourselves. So it could be that, in order not to compromise this profound change, we again started to drive people into leasing.

[Veprin] No, Mikhail Sergeyevich, I have not finished.

[Gorbachev] Well, go ahead.

[Veprin] I believe this matter must be studied well. We have farms where the muzhik keeps five or six head of cattle. Naturally, he milks there well over 1,500 litres of milk per cow. And his wife works as a milkmaid and a herdsman. But the sovkhoz obtains from these people 1,500 kg of milk (?at the most). Why is he going to the farm to work? He is going there to steal, to support his farm.

[Gorbachev] Right.

[Veprin] So, I think that at such farms one must pose the question: Either you work or we dissolve the kolkhoz and the sovkhoz. Please, there is land for you. Here are your cows and you take up production. I am not saying that. I am not saying this to start a quarrel, to force people into it.

[Gorbachev] Yes.

[Veprin] Under no circumstances!

[Gorbachev] This is inadmissible.

[Veprin] The voluntary principle is absolute, absolute. I think that...

[Gorbachev, interrupting] Then bear in mind, very many are not overeager. One must look night and day to see what is taking place on the land, in the livestock unit, and on the meadow. One must look night and day.

[Veprin] Almost no one wishes [to work]. Why should he work when he can loaf and make a fuss, so to speak, and get paid?

[Gorbachev] This is why I say we have stripped the country of its farmers.

[Veprin] If no cardinal measures are adopted with regard to agriculture in Krasnoyarsk Kray, I have to tell you that a few years from now we will be looking for farmers in the red book. I am not joking when I say this. I am perfectly serious.

[Gorbachev] Given such a development and the dearth of cadres when everything will be in flux there, if the

countryside cannot come up with a corresponding situation, so to speak, which would interest a person and enhance his importance and work, then he will abandon the countryside and the last one will leave there. [end recording]

[Announcer] The meeting was also addressed by the general directors of the Krasnoyarskugol Bychkov, Krastyazhmash Rumyantsev, and Krasnoyarsklesprom Kirilov associations; Sokolov, the rector of Krasnoyarsk University; Durasov, minister of non-ferrous metallurgy; Shchadov, minister of the coal industry; and Batalin, deputy chairman of the USSR Council of Ministers.

Meeting Summarized

18140502 Moscow TASS in English
1930 GMT 13 Sep 88

[Text] Krasnoyarsk September 13 TASS—Mikhail Gorbachev, general secretary of the CPSU Central Committee, today had a meeting with scientists from the Krasnoyarsk branch of the Soviet Academy of Sciences' Siberian Division.

It centered on the issue of how to use the research potential more effectively to develop the Krasnoyarsk territory.

Greeting the attending scientists, Gorbachev expressed satisfaction with the results of his first meetings with Siberians.

Getting acquainted with the affairs of a territory at a crucial phase in economic development is always interesting, especially if this territory begins in southern steppes and ends at Arctic seas and is inhabited by a special kind of people settling the stern expanses of the north, he noted.

"But it is neither romance nor curiosity that underlie my current trip here. We are concerned about the way things are going in the Krasnoyarsk territory," Gorbachev added.

The subject of economic development in the area has been raised at various conferences and meetings more and more often and very many letters have come in over the past couple of years from working people in the Krasnoyarsk territory on a very wide range of matters with a bearing on both their lives and the progress of work to fulfil national economic tasks, Gorbachev explained.

"Look what is happening: Enormous capital investments running into billions of roubles have been funneled here. It would seem that this is a foundation good enough for making a sensible approach, considering that territorial complexes are as yet only being established and there is a respected academy from which we are entitled to expect a coherent scientific forecast.

"But what is happening? Where has the scientific approach been lost? Who is to blame for this? At which management level has it been buried if we now can see a gap in the pace of building production facilities and the infrastructure, most notably the social one, if the buildup of capabilities has run into acute ecological issues and if a continued construction of water development schemes is threatening the loss of millions of hectares of land?

"Scientists, in the meantime, promised us that everything would be okay when those power stations and dams were being raised one after another. People are very concerned about the situation. You, those living here, are aware apparently as well that the people today do not want to put up with it.

"If we go along the same path further, this will mean squandering billions of roubles and provoking an unbearable situation here. Is it the way in which we should build?

"Is it in this way, comrades, that business should be conducted, with both nature being endangered and the interests of people pushed into the back seat? This won't do, this can't continue and is no longer continuing.

"Let us be objective. You scientists are, as they say, the keepers of scientific truth on regional development. And I would like our discussion to be conducted in a party and statesmanlike style and hence in a responsible and principled manner. We need this badly," Gorbachev said.

He warned that "if we don't turn sharply to popular interests now, the state won't gain anything either as the development of productive forces will grind to a halt. Society cannot be developed under an extensive economy and with a big gap between economic and social advancement. We cannot accept it."

Much attention at the meeting was paid to the issues of developing agriculture and related industries in the Krasnoyarsk territory.

Gorbachev noted that the food problem remains a sharp one here. "People are right in saying: We are prepared to endure both difficulties and ecological pressure (these things are regulated quickly) if only real headway is made in fulfilling the food program. And regional science should secure this headway," he said.

Summing up the results of the meeting, Gorbachev said the discussion should be continued and will be crowned with practical decisions.

But there are problems that call for a more substantial and thorough study so that they will be included in plans for the 13th five-year planning period and the years beyond it until 2005.

A number of issues, however, can be singled out to be resolved within the next two or three years so that to bring about a drastic change for the better, Gorbachev said.

He disclosed that it is provided to discuss agrarian policy in detail at the next plenum of the party's Central Committee.

The theme of ecology, he said, today was mentioned only in passing but it is just as sharp, he added, as the problems he addressed earlier.

Gorbachev went on to say that a list of urgent problems, a kind of minimum program on ecology, has to be drawn up and that after all these programs brooking no delay, including the food, housing and ecological ones, are finalized, the people should be given an account.

Many working people are now saying, the general secretary noted, that officials are in no hurry, that they are dragging their feet, that problems are piling up, while the bosses keep holding their conferences.

"So maybe this meeting of ours, if it does not lead to a changed state of things, will be called another such conference, too, only a high-level one? [sentence as received]

"It will be simply a scandal if after our discussion nothing of substance happens either here or in the center. We must not allow this. We must mend things decisively. I think the Politburo will issue political instructions on this score," Gorbachev said.

He is continuing his meetings in the Krasnoyarsk territory.

Paton on Effects of Perestroika
18140308 Moscow IZVESTIYA in Russian
31 Jul 88 p 2

[Interview with Academician B. Paton by Ye. Manucharova and S. Tsikora: "Old Problems in the Light of New Thinking"]

[Text] **The big question for people in science today is: does restructuring affect their field? And if so, in precisely what way? In which aspect will the revolutionary situation be developed? For the time being, there are still few scientists who have decided to formulate the problem of what takes first priority today, what must be dealt with without delay, so as not to lose the energy of the first impetus?**

Academician B. Ye. Paton, Ukrainian Academy of Sciences president, has agreed to discuss this question with us. Here is Boris Yevgenyevich's opinion:

We must change cadre policy and allocate money differently. Science will not gain new ideas without people who think at a high level. There is no opportunity to

implement these ideas, without sensible financing. Therefore, I would say that cadres and finances are the first priorities in organizing science and that, of the problems being solved by science today, the Food Program and the problem of protecting the environment and the ecology, which is related to all problems, take priority.

We would like to understand how scientists seek out and find solutions to such complex problems—so complex, that just one of them seems simply impossible. Do you, Boris Yevgenyevich, think that it is possible to halt the destruction of nature?

To a very great extent: I believe in science and in the restorative forces of nature itself. Consider how quickly the birds returned to the Kiev area after the Chernobyl catastrophe. After all, at that time even the sparrows had vanished from the city...

It is good that many people understand the urgency of the ecological problem. People of all professions are discussing them extensively and everyone is proposing their own solutions, based most frequently on their own common-sense positions. Writers, men of art and some scientists support the viewpoint that nature can be saved only by shutting down many industries. They do not believe in the effectiveness of cleaning equipment and describe our relations with living nature by the terrible term "cannibalism." There is something to this.... However, the opponents of this approach have their reasons as well: since nobody wants to live poorly, we must increase the might of industry with all available means in order to live comfortably.

Both positions seem obsolete and one-sided to me. The world will never cease worrying about sufficiency. This is simply inevitable. However, it does not mean that we must inevitably use extensive methods. Consider, for example, our power system. We build and build ever-newer and newer thermal and nuclear electric power stations, increasing their power capacities without restraint. Yet, what does world experience tell us? The 1973-1974 energy crisis forced the world to find new ways to solve this problem. Based on scientific developments, energy outlays in many Western countries for manufacturing the most important types of products was reduced by a factor of 2-6, relative to our outlays. Japan, which has radically increased its overall production output, has not increased its energy outlays. New technologies have made this possible.

It is precisely these truly revolutionary technologies which will enable us to live without annihilating nature.

In my opinion, this is the first of three mandatory principles for organizing the rational use of nature. The essence of the second principle lies in fundamentally changing our economic structure and in sensibly locating our production facilities. I shall turn to the Ukraine for examples. Over many decades the republic has become a land of metal, coal, ore and large-scale chemistry. This is

an accurate picture. However, we should remember that all of these industries are the basic environmental polluters and use a tremendous amount of fresh water.

Yet, water reserves in the Ukraine are scant: on a per capita basis, this region holds one of the last places among all the union republics. When it became clear that somewhat more than a single Dnepr would be required in order to further develop the metallurgical and chemical industries in the Ukraine, a project for the fundamental breaking of nature sprang up. It is analogous to redirecting the northern rivers to the south. After several years of bitter debates, the Siberian rivers succeeded in remaining, yet passions surrounding the Dunay-Dnepr water resources complex continue to seethe even to this very day. This was discussed at the 19th Party Conference as well.

I cannot say that this project is even slightly sensible. It is bad enough that it proposes encroaching on the life of the entire Black Sea, by damming the Dnepr-Bug Estuary. This raises a strange problem—cutting the Dnepr off from the Black Sea.

Scientists from the republic and union academies of sciences have reached synonymous conclusions. We believe that building the Dunay-Dnepr Complex will lead to the most serious consequences, both ecological and economic. After all, it proposes inundating the most fertile lands of the southern Ukraine with polluted water (the Dunay is called the "cesspool" of Europe for good reason!). This means losing them. However, even at such a price we would not achieve gains in industry. After all, the exact same extensive economic methods would be developed: we would build newer and newer factories for large-scale chemistry, metallurgy and the power industry.

Nature is already unable to withstand this intensified industrial pressing, determined by people's traditional thinking: take everything from nature. We must reject this stereotypical approach and re-orient the economy toward developing science-intensive industries—electronics, instrument building and precision machine building. These do not lead to ecological disruptions.

The opposition of the two approaches to nature and economics can be understood from the following example. There is a very old metallurgical plant in the center of Dnepropetrovsk which is due for reconstruction. How will this be done? It would be most sensible to re-orient it toward fundamentally new technologies for producing high quality metal. That is the modern way. However, at the present time the traditional way is winning. The proposal is to make household stoves, to build an integrated metallurgical plant, in the center of the city. The loyalty of planning agencies to their old rut, as well as the egotism of the ministries, turns out to far exceed all else.

So, here is the third trend which we must work toward in order to preserve nature. Industrial wastes and secondary resources are polluting the environment. We ought to

learn how to recycle them. Our indicator for the utilization of secondary resources is persistently stuck at mere fractions of a percent. However, today in Sweden, for instance, approximately half of all industrial production is manufactured using secondary resources. There they are actively applying modern technologies.

Our new thinking will require a broad outlook, a great deal of practically acquired knowledge of world experience and its utilization. Decisions should be made based on objective processing of information—according to the complete possibilities, and not the principle “I propose....”

When you speak of acquiring complete information, do you include the wealth of information in libraries and the possibility of using it?

I would like to. However, the condition of our libraries does not always permit this. The situation of these information storehouses is a painful problem. We are procrastinating on solving it and because of this we are paying (repeatedly!) the unpleasant consequences. Yet the developed countries changed the countenance of their libraries a long time ago, in order to utilize the reservoirs of knowledge more intensively.

The U.S. Library of Congress, the world's largest library, has already been using just an electronic catalogue for 8 years. It has become a part of the state administrative system. Library subscribers—from congressmen to the ordinary user—can order the information which interests them via communication channels and obtain a picture of the required text on a display screen within seconds.

Unfortunately, we are far behind schedule in updating library operation. We are only just starting to computerize them. Our catalogues are on “cards” and are far from complete.

As a result, we are shut off from the data banks in the West by a “electronic curtain,” and from books stored in our own libraries—by the lack of complete information about them, the lack of truly modern technical library equipment. However, being within the system of world culture and not using its innovations means in good time and forever dooming ourselves to backwardness....

We have examined the way in which library resources at scientific research institutes are being used. It turns out that scientists, even academicians, are not asking for books. We became interested: perhaps, this situation only exists in our institutes? Alas, the same is true in other academies. This can be partially explained by the size of the information avalanche which has hit mankind in recent years. Our brains are simply incapable of comprehending and processing everything.

Today, scientists and politicians need more than just books that enlighten the mind: they also need “extracts” of specific information on specific questions. This will

undoubtedly help them to make truly scientifically substantiated decisions within the necessary time period. This is why interest today in electronic data banks is far greater than that in reference journals.

How can we correct this situation? Not by increasing the number of library personnel for preparing survey-analytical references, but by equipping them with modern computer hardware for acquiring information at a qualitatively new level. In our republic, an electronic catalogue is being prepared for five of the largest libraries through the efforts of enthusiasts (I include the director of the USSR Academy of Sciences Central Scientific Library as first among them).

However, this is not enough. It is urgently necessary to develop a state-wide information system. At the present time there are extremely few data banks in the country. We must spare no resources in creating them and without fail we must enter the international information banks. We cannot live without practical access to world-wide storehouses of the latest data.

A clear concept of information sciences is lacking in the country. We must develop a national program, in the same way that the Food Program and Energy Program were developed and that a program for new materials is currently being created. Without this it will be very difficult to solve the problems of restructuring.

Permit us to return to the conditions which you consider mandatory for restructuring science. Can the cadre problem be treated as a problem of finding talented people?

Ideally, yes. However, matters with talented people and finding them are dismal for now. Yet today it is even more important to deal with this problem, than with developing scientific trends. We know people who to this day hold high scientific positions and have certain virtues in the human sense, but are worthless as scientists. Such leaders were at one time convenient for the “top,” but they have always been dangerous for science, above all, in that they give rise to armies of executives who are even more uninspired and dull than they themselves.

The role of the individual in science is critical, particularly that of the head of a scientific collective. His work is difficult and often thankless, and thus the “director problem” will probably exist forever.

However, it can be solved—precisely today, in the period of glasnost and democracy, when scientific collectives have become vitally interested in electing their leaders.

I must mention that for now the world does not know of a better method for selecting leaders, for understanding a person's level and qualifications, than free advancement “from below.” The problem of cadre leadership cannot be solved by appointments from above. Democracy, with its glasnost and secret voting, is necessary.

I think that it would be useful to expand elective rights in our academic institutions. We must not impose director turnover and re-shufflings upon scientific collectives. In fact, why is it being suggested that one person can only be elected head of an academic research collective twice? Simply because such a system is being adopted for leaders elected to the party and soviet agencies?

In my opinion, this is unfair. There is no danger of "leaderism" in a scientific collective. In order to lead scientists, one must be capable of generating and giving ideas. Only under these conditions can a person create his own school and head a scientific trend. However, a decade is quite insufficient in order to develop it. This, as well as, incidentally, the need to restrict leaders to a certain age, has been proven by world experience. However, today I am referring to the new directors, those who came to this position at the age of 35 or 40. After two terms, these will be people full of strength. However, the rule now being proposed would require them to leave their work. This even implies the destruction of entire scientific schools.

Again, a question on a difficult decision: tell us about the new principles for financing science, in particular, the "system of grants," which is new for us.

It is a system which could be called "death to the untalented." However, only in the event that the system is not distorted, not narrowed into an inner-union system, that it is carried out just as it is in the rest of the world. It exists precisely in all world science, not divided by regions.

What is a grant? You wrote about this in your interview with Academician Yu. Gleba. However, we repeat, this will not be a bad thing. A grant is a large sum of money which is allocated for the solution of important and difficult scientific problems. It is given to that researcher (regardless of the country in which he works) who, relative to the others, is the most likely to solve the problem. His previous work, known to the entire international society, speaks on his behalf in front of the experts. He should have a reputation as a talented person, should be goal-oriented, and have a well-equipped laboratory. In short, grants are aimed at finding and encouraging those talented people, about whom you asked.

I am glad that we are adopting this system and that the new approaches to budget financing of academic science are fully compatible with it: money will be allocated for a specific theme, for a goal. The size of the budget financing for each of the scientific institutions will be determined depending on its contribution to solving the most important fundamental problems and on its participation in state programs. Such programs will consist of projects which have undergone a competitive selection and have obtained (via secret voting) the highest evaluations by experts, preferably, by extra-departmental and, possibly, international experts.

Today it is understood and acknowledged that the further orientation of academy and VUZ science toward cost-accounting alone will ruin its base of bases—fundamental research. They were also pressured in this way by the previous system of financing, in which priority was given to departmental applied projects and immediate benefits.

The main principle of the new system is to increase the independence of institutes. The institutes themselves should choose the contents of their own economic contract projects and budget projects, and should pattern the institute themselves. In general, I am convinced that the center of gravity should be shifted to the institutes themselves.

Today the director has been given quite sufficient rights—but he must be a man! I would like to include all the meanings given in Dal's dictionary in this word: do not be timid, do not retreat from work, do not move backwards.

Would you conclude that all is well, that an optimal system has finally been created?

All is well only in the sense that there is somewhere to go.

We had a system in which initiative was punished. Today initiative is encouraged. Yet, we need a third thing: a system in which lack of initiative will be punished. As for how to devise such a system—everyone should think about this.

13362

Bureaucracy Obstructs New Law on Cooperatives
18140303 Moscow NTR in Russian
No 8, 19 Apr-2 May 88 p 5

[Article by A. Kuteynikov, candidate of economic sciences, under the rubric: "Discussing the Draft Law on Cooperatives:" "According to Labor at Last?"]

[Text] The idea of cooperatives has stirred up the entire society. Many see it as a return to the development of Leninist cost-accounting economic principles, and many—as an attempt to restore capitalism. There are hopes that cooperatives will alleviate various sorts of shortages. There are fears that they will serve as a cover for large-scale machinations and the extraction of unearned income. Despite the entire diversity of viewpoints, a common factor stands out: those who obtain equal pay for less work in the state sector, as well as those who, due to their privileged status, acquire a considerable number of various benefits for the same amount of input labor, as a rule, condemn cooperatives. People whose labor does not receive proper recognition in state and social organizations, whose initiative and creativity are not allowed to develop within the paralyzed frameworks of state schedules, welcome the cooperatives.

It is no secret that the second category most frequently includes engineers, designers, scientists, particularly young, recent VUZ graduates. Their wages are somewhat lower than the average for the country, and there are no efforts being made whatsoever in the work place to let them earn enough to support a family.

The cooperative will make it possible to directly relate the quantity and quality of labor by such people to their earned incomes.

By way of example, let us consider two typical situations, repeatedly encountered in the pages of our press. The first situation: a scientist develops some sort of technology, which when applied yields a multi-million ruble economic effect and, by the same token, invokes the wrath of his own institute administration. It turns out that the result of this one scientist's labor exceeds, in terms of its potential economic effect, the labor results of all the institute's employees for two or three of the last 5-year periods by a factor of 10. In the best case, several leading co-authors are foisted upon the idea's author, before his development can be practically applied, and in the worst case, he is driven out of the collective, the calm of which has been disturbed by his ideas.

The second situation: an ordinary master lathe operator (a machinist, etc.) creates instruments and devices, such that he is able to increase labor productivity 100 percent. His colleagues at work set up obstructions for him, since the norms are being re-considered and their rates are being cut as a result of the inventor's actions. The enterprise where the master lathe operator works is up to its neck in its own concerns and unable to organize its own mass production of the new instrument for sale on the side.

In future months both characters of these stories will be able to fulfill their potential for society.

The first will be able to form a so-called introduction cooperative with like-minded colleagues, which will actually sell licenses to the right to use the new technologies and will supervise the introduction process. License payments may be received both from Soviet, as well as foreign companies.

Our second hero, upon joining forces with similar highly skilled workers, will be able to organize a small specialized company. Such types of service may be performed in virtually any area, from jurisprudence and advertising to programming, engineering and expert patent examination.

World experience in economic development has shown convincingly enough that scientific and technical progress is manifested in the output of ever more specialized products, oriented toward a specific use. In this regard, small specialized enterprises, which produce output in relatively small series or by order, turn out to be in the mainstream of scientific and technical progress. The

main feature of these enterprises is flexibility, a rapid adaptation to demand. The motto of efficient economic management, "small is good," which appeared in the United States along with the new stage of scientific and technical progress, will finally be implemented in our country by the cooperative.

In this sense, the provision of the draft Law on the Cooperative which stipulates a reporting (registration), rather than authorized, procedure for forming cooperatives, is very important. Freedom in forming and developing new economic entities is an entirely necessary condition for the effective development of scientific and technical progress. Without such freedom, holes will remain in the fabric of any economy, unique empty "economic niches," the presence of which reduces the efficiency of the national economic complex on the whole. Today the hope is that cooperatives will quickly fill these niches.

Possibly, the reader has received the impression that the inventor is an ardent proponent not only of the idea of the cooperative itself, but also of the draft Law on the Cooperatives, in the form in which it was presented for national discussion. To a significant extent this is so. However, each of us must clearly realize that there are wordings in this draft which might completely emasculate the contents of the entire law. Using these wordings, the antagonists of cooperatives have already begun an offensive.

The first and probably decisive strike was the USSR Minfin resolution on income tax for cooperatives, adopted without any discussion in the press at all and entering into effect as of 1 April. In accordance with this decision, a punitive tax has been levied on the income of cooperatives which limits their monthly earnings in practice to a sum of no more than 1,000 rubles, regardless of the labor result. In this case, contradictions in the draft law (article 18 on taxation, and article 22 on the rights of cooperative members) have been resolved in advance, against the cooperative.

In using this contradiction, Minfin has implemented a plan for taxing the income of cooperatives which is not being used in a single developed country of the world. According to this plan, a sliding (up to 90 percent) tax rate is being taken from an overly low income base, which comes to only 500 rubles in all. Even to someone without a specialized economic education, it is obvious that a generally acceptable plan provides the tax-payer with an incentive to work more, in order to earn more. According to the plan thought up by Minfin, the incomes of a hard- and an average-working cooperative member might not differ at all.

The defenders of such "barracks" justice love to count the money in other people's pockets and really do not like to earn such money through their own labor. They claim to know the extent to which the earnings of the

talented and the gift-less, the enterprising and the initiative-less, can be distinguished. It would not hurt such people to recall that the development of the cooperative movement is directly related to the growth of social wealth and, consequently, raising the well-being of every member of society. However, the Minfin resolution, it seems, reflects more than a flaw in taxation methodology. It is far worse that as a result of this resolution cooperatives are discriminated against in comparison with other workers in our country. After all, the draft Law on the Cooperative states: "The social significance of labor in a cooperative is equal to that of labor of workers and employees in state and other enterprises, organizations and establishments... The maximum amount of earnings is not limited."

It is hard to presume that nobody at Minfin knows about the so-called "Laffer curve," which shows that maximal tax receipts in the state budget occur at a sparing tax-rate level, which stimulates producers to develop production. Rates that exceed this optimal level reduce business activity in the country and, consequently, budget receipts as well.

Increased taxes have a particularly oppressive effect on undertakings that involve technical innovation which, on the one hand, presume a high degree of technical and commercial risk, and on the other—a super-profit for the enterprising innovators in the event of their invention's market success. When the risk is preserved, but the super profit is removed, the number of people wishing to become involved in such an undertaking (experience in the United States during the 1970s has shown this quite clearly!) declines by a factor of hundreds.

The present Minfin resolution represents a typical attempt to substitute articles of the Criminal Code for the action of economic laws. After all, it is obvious that a tax plan, introduced for the incomes of cooperatives in an authoritarian manner and applied to the most profitable cooperatives and those with long capital turn-over periods, is synonymous with financial crimes, which in turn cause the administrative regimentation of cooperative activities to become stricter.

Once again, commands are being substituted for economic incentives. Perhaps some people (chiefs, as a rule) like them, yet commands have one essential flaw: it is possible to be obedient on command, but not to be initiative-minded, to be creative, on command.

What can we propose as a democratic alternative to the authoritarian Minfin resolution? In all developed countries, income tax rates (the values of which, as a rule, do not depend on the source of income) take the form of state laws passed by the higher agencies of power after stormy debates (in the press as well). Is it not time for us, without assuming departmental comprehension of the tasks of restructuring, to include a specific regulation on the principles and maximally permissible tax rates directly in the text of the USSR Law on the Cooperative? After this, it would then be possible to consider working out an All-Union Law on Income Tax, levied according to unified rates for all citizens regardless of their source of income.

Formation, Operation of Interbranch Complexes

18140253 Moscow IZVESTIYA AKADEMII NAUK
SSSR, SERIYA EKONOMICHESKAYA in Russian
No 1, 1988 pp 30-39

[Article by Ye.V. Rudneva: "Interbranch Scientific Technical Complexes: The Problems of Formation and Operation"; first paragraph is IZVESTIYA AKADEMII NAUK SSSR, SERIYA EKONOMICHESKAYA introduction]

[Text] The peculiarities of the new economic organizational form of the integration of science and production, which is aimed at the acceleration of the development and introduction of fundamentally new types of equipment and technology, are examined. The types of interbranch scientific technical complexes, which differ in tasks, the nature of activity, and the composition of the participants, are distinguished. The first results of the work of interbranch scientific technical complexes and the difficulties of their operation, which are due to shortcomings of the organization of the complexes and the used methods of the planning and management of them, are presented. A set of steps, which is aimed at the assurance of the economic organizational unity of interbranch scientific technical complexes and the creation of the conditions of their efficient operation, is proposed.

The accomplishment of the task of accelerating scientific and technical progress, which was advanced by the 27th CPSU Congress, requires qualitatively new organizational forms and an economic mechanism of the management of research and development and the uniting of science and production. Interbranch scientific technical complexes are one of these forms, which are aimed at the development and extensive dissemination in the national economy of advanced types of equipment, technology, and materials. In 1987 there were already 21 interbranch scientific technical complexes in the country. In aggregate they encompassed about 500 organizations and enterprises of more than 60 ministries and departments [1, No 17].

Significant possibilities of the increase of the quality of scientific research and development and the speeding up of the introduction in production of new generations of equipment are incorporated in this new form of intersectorial integration. Thus, the priority allocation of resources, which are necessary for the development of interbranch scientific technical complexes, particularly for the establishment of their experimental base, centers of the collective use of instruments, and so on, expands the material and technical supply of scientific research. The inclusion as a part of interbranch scientific technical complexes of pilot plants creates the prerequisites for the speeding up of the processes of bringing models of new equipment up to use in production. The performance in accordance with a common plan under common supervision of all the stages of work—from basic research to the assimilation of innovations in production—makes it possible to decrease the expenditures of time on the

transfer and approval of the intermediate results. Moreover, interbranch scientific technical complexes are organizationally ready for the implementation of the stages of research and development with mutual overlapping [2, No 4]. For example, the preparation of production, the modernization of the enterprise, and the retraining of personnel can be started before the research is completely finished. At the same time the listed potentials, which promote the accomplishment of priority scientific and technical tasks, the acceleration of development, and the introduction of innovations, can hardly be realized on the established economic organizational "foundation," without the creation of economic, legal, and other conditions that are equal to the goals of the formation of interbranch scientific technical complexes and to the peculiarities of their activity.

The majority of complexes have been operating less than 2 years. However, in such a short time both successes and significant difficulties in their work, which are due, in our opinion, to a number of substantial shortcomings in the organization and the used methods of the management of interbranch scientific technical complexes and in the coordination of their relations with partners, have also appeared.

The results of the work of such complexes as the Mikrokhirurgiya glaza, Rotor, and Institut elektrosvarki imeni Ye.O. Patona complexes are representative. At the Mikrokhirurgiya glaza Interbranch Scientific Technical Complex more than 11,000 operations were performed during the first quarter of 1987. The use of a new technology of their performance (according to the conveyor method) is making it possible to increase the quality of the operations by several fold and to shorten substantially the time of treatment [1, No 20]. Already in 1987, 442 automatic rotary and rotary conveyor lines will be produced in accordance with developments of the Rotor Interbranch Scientific Technical Complex, while in all during the 12th Five-Year Plan more than 6,300 will be produced [1, No 17]. The planned economic impact from their introduction comes to 409 million rubles, the anticipated number of conditionally released workers comes to 76,840 [2, No 3]. At the same time during the operation of these complexes a number of factors, which are slowing the pace of their development, also appeared: petty tutelage on the part of the RSFSR State Planning Committee and the USSR Ministry of Finance, which is creating difficulties in the work of the Mikrokhirurgiya glaza Interbranch Scientific Technical Complex [1, No 20], the substantial lag in the development of the experimental base of organizations, the shortage of designers and process engineers (at the Rotor Complex) [2, No 3].

During the establishment and operation of a number of other interbranch scientific technical complexes even more substantial problems arose: the determination of the composition of the participants (at half of the complexes the question of the choice of participants was inadequately studied, which subsequently required the

revision of their composition) [1, No 17]); the formulation of common plans of the work of interbranch scientific technical complexes; the establishment of effective relations with partners; the determination of the place of the interbranch scientific technical complexes and the procedure of interaction with the ministries and departments, to the systems of which the complexes belong. Thus, the instances of the violation by ministries of the rights of interbranch scientific technical complexes and direct interference in their activity are frequent. For example, the USSR Ministry of the Petroleum Industry contrary to legislation confiscated from the scientific institutions of the Nefteotdacha Interbranch Scientific Technical Complex the balance of the wage fund, which was not spent in 1986 and which the institutes had planned to allocate this year for the stimulation of the completion of especially difficult and responsible jobs [1, No 17].

The listed problems can be explained by several factors: first, by the novelty of this organizational form and by the lack of experience in establishing effective intersectorial relations; second (and this seems most significant), by the fundamental shortcomings of the existing approach to the establishment of interbranch scientific technical complexes and the management of their activity.

The study of the Model Statute on the Interbranch Scientific Technical Complex, the composition, the goals of establishment, the functions, and the work experience of operating complexes makes it possible to identify the following, in our opinion, basic shortcomings in their organization and management: 1) the ambiguous definition of the specific nature of interbranch scientific technical complexes and their functions; 2) the inclusion of these complexes, which are objects of an intersectorial type, in the systems of sectorial ministries and departments; 3) the inadequate effectiveness of the forms, which have been adopted at interbranch scientific technical complexes, of plan coordination, the stimulation of participants, and the procedure of allocating resources for the accomplishment of the tasks that have been set for the complexes. Let us examine each of these shortcomings in greater detail.

The analysis of the goals of the establishment, the composition of the participants, and the nature of the end results of the work of complexes shows that at present at least two types of the integration of scientific research organizations and enterprises of different sectors, which have been united by the common name interbranch scientific technical complex, are operating. The first type, which encompasses the majority of operating interbranch scientific technical complexes, is an association of scientific research and planning design organizations and pilot plants of several sectors, which is formed for the purpose of developing and, as a rule, introducing in the national economy fundamentally new types of equipment, technology, and materials (for example, laser equipment and technology—the Tekhnologicheskkiye lazery Interbranch Scientific Technical Complex, diagnostic aids which make it possible to ensure an

increase of the reliability and life of machines and components—the Nadezhnost mashin Complex, high-performance membrane separators—the Membrany Interbranch Scientific Technical Complex).

The integration of the activity of organizations and enterprises, which perform different stages of the work—from the stage of basic research, which is conducted within a specific scientific and technical direction, to the stage that precedes the mass production of new equipment—is accomplished at interbranch scientific technical complexes of this type. But here scientific research institutes, planning and design bureaus, and scientific production associations constitute the bulk of the organizations, which belong to the complex and participate in its work. The pilot works and experimental enterprises, which have been involved in their work, perform in a certain sense a subordinate role, making prototypes for the checking of new technical solutions or producing small batches of new equipment for its transfer to producers and users for the purpose of subsequent large-scale introduction.

The goal of the formation of complexes of the second type (to which, in particular, the Mikrokhirurgiya glaza Interbranch Scientific Technical Complex belongs) is the rendering of a specific type of services or the output of a product on a fundamentally new technical and technological basis, which was developed by scientific organizations of the complexes. Without changing the significance of the stage of scientific research and development, such an orientation of the work of complexes has a substantial influence on the relations between their scientific and production subdivisions. In other words, in complexes of the first type production plays a supporting role, in complexes of the second type, on the contrary, the scientific subdivisions “work for production.”

By examining on the basis of the Mikrokhirurgiya glaza Interbranch Scientific Technical Complex the complexes of the second type, it is possible to conclude that with respect to the tasks, the nature of activity, and the composition of the participants they are a new type of scientific production associations—intersectorial scientific production associations. Their emergence is natural. It reflects the nature of the development of modern technology, which needs intensive scientific modernization, which has been impeded by sectorial boundaries.

The complexes of the first type, which “work” for a specific goal which is connected with the attainment in the shortest time in specific scientific and technical directions of leading levels in the world, are in essence an organizational form of the implementation of all-union intersectorial scientific and technical programs. The program of the solution of a major scientific and technical problem, which is of great national economic importance and for which the interbranch scientific technical complex is established, specifies the concept of its establishment and operation, the basic tasks of development,

the stages and time of the performance of the corresponding operations, the end results, and the need for resources by stages. At present such an approach, which presumes the use of the principles of program planning (the formulation of an all-union program, of which the interbranch scientific technical complex serves as the organizational form of implementation, or the use of program methods of planning and management when carrying out specific groups of research and development and work on the introduction of their results), is already being used at a number of interbranch scientific technical complexes, for example, the Rotor Complex [2, No 3] and the Institut elektrosvarki imeni Ye.O. Patona Complex [2, No 4]. The results of the operation of these complexes attest to its effectiveness.

Obviously, the differences in the goals of the establishment and the nature of the activity of the types of interbranch scientific technical complexes in question cannot but lead to certain distinctions in the forms of organization and the methods of their planning and management.¹ Thus, the existence of stable relations between the scientific and production subdivisions in complexes of the second type and their work mainly or only "for the interbranch scientific technical complex" make it possible to infer the advisability of the use in their management of linear functional structures, that is, the subordination of all the enterprises and scientific research institutes, which belong to the interbranch scientific technical complex, to the head organization of the complex. On the other hand, in interbranch scientific technical complexes of the second type, just as in other program complexes, such an organizational decision in general is inefficient. The enterprises, scientific research institutes, and scientific production associations, which are a part of the complex and participate in its work, as the Model Statute on the Interbranch Scientific Technical Complex requires, should retain their subordination. This presumes the giving to the head organization of the complex of a number of rights in the area of plan coordination, stimulation, and the disposal of resources, by the exercise of which it will be able to supervise efficiently the members of the interbranch scientific technical complex.

The nature of the activity of complexes also determines the differences in the composition of the centrally planned indicators, in the forms of the disposal of resources, and in the methods of distributing revenues. Therefore, the formulation of uniform methods of the management of intersectorial scientific production associations and complexes that are established for the implementation of all-union scientific and technical progress, which are so different in the tasks, the nature of activity, and the relations between components, is hardly possible. The indicated circumstance does not provide adequate grounds for their unification under the aegis of interbranch scientific technical complexes.

The inclusion of interbranch scientific technical complexes in the systems of the head ministries and departments is the next shortcoming of the prevailing practice

of their formation. Within the established economic mechanism, in which for the present intrasectorial relations are receiving priority, such inclusion creates substantial difficulties in the work of complexes. As the experience of the operation of interbranch scientific technical complexes of academic subordination showed, their head organizations have not succeeded in involving in the work the potential of all the members of the complex, many interbranch scientific technical complexes have experienced serious difficulties with the duplication of their developments on an extensive scale. As a result of this directive organs adopted decisions on the resubordination to sectorial ministries of the academic Svetovod, Personalnyye EVM, and Nadezhnost mashin interbranch scientific technical complexes. The corresponding ministries were attached to other interbranch scientific technical complexes (the Termosintez, Biogen, and Katalizator complexes). As the same time, as the experience of the Robot Interbranch Scientific Technical Complex of the Ministry of Instrument Making, Automation Equipment, and Control Systems testifies, the subordination of the complex to a sectorial ministry also does not solve the problems of its operation. Here difficulties arise with the reflection of the assignments on the production of the components, which interbranch scientific technical complexes need, and on the production of equipment in the plans of enterprises from other ministries, with the assurance of deliveries through cooperation, and so on.²

The cited examples make it possible to draw the conclusion that interbranch scientific technical complexes, which are objects of an intersectorial type, should be established within organs of intersectorial management. For example, the group of complexes of the machine building type, particularly the already mentioned Robot and Nadezhnost mashin interbranch scientific technical complexes, could be subordinated directly to the Bureau for Machine Building of the USSR Council of Ministers. In the absence of an organ of intersectorial management, which corresponds to the direction of the work of the complex, the interbranch scientific technical complex can be established under the USSR Council of Ministers. While not solving all the problems of the establishment of effective intersectorial relations, such a procedure all the same would create the prerequisites for speeding up the drafting of unified plans of interbranch scientific technical complexes and supplying the complexes with resources.

The problem of forming the internal structure of interbranch scientific technical complexes is also connected with the question of their departmental subordination. In conformity with the prevailing order the complex includes a head organization, institutions and enterprises, which are a part of it and which conduct research and development in the scientific and technical direction that is attached to the interbranch scientific technical complex, as well as organizations and enterprises, which are taking part in its work and have for this the corresponding scientific, technical, and production potential.

But all these organizations, institutions, and enterprises, which have been included in the interbranch scientific technical complex, retain their rights, functions, and departmental subordination. Thereby their status differs little from the status of the institutions and enterprises, which are participating in the work of the complexes.

To what is the need to distinguish within the interbranch scientific technical complex two types of organizations: those which are directly a part of the complex and those which are participating in its activity, due? What are the criteria of the assignment of organizations and enterprises to one category or the other?

In case of the establishment of the now operating interbranch scientific technical complexes the composition of the organizations and institutions, which belong to them and participate in their activity, was determined on the basis of departmental subordination. The organizations and enterprises of the ministry or department, to whose system the complex belongs, were included among the former. The organizations of all other interested ministries and departments were grouped with the latter. The subsequent revisions of the composition of a number of interbranch scientific technical complexes were accompanied by the rejection of the choice of organizations, which belong to the complex, according to the principle of their departmental subordination. At present various organizations of both the same and different ministries and departments can participate in the work of a complex or directly be a part of it. Thus, the question of the criteria of the assignment of scientific research institutes, scientific production associations, and enterprises to one category or another when specifying the composition of an interbranch scientific technical complex arises. Its settlement is closely connected with the question of the status of different organizations in the interbranch scientific technical complex and of the methods of supervising their activity on the part of the organ of management of the complex (at present this is the council of the complex, which is headed by its general director, as a rule, the manager of the head organization of the interbranch scientific technical complex).

As was noted above, the organizations of an interbranch scientific technical complex retain their department subordination. Their resubordination, transfer to the organ of management of the interbranch scientific technical complex most often is inadvisable, inasmuch as at the same time as participation in the work of the complex they can also fulfill other important assignments. Another extreme version—the accomplishment of the tasks set for the complex on the basis of standard forms of management, that is, by relying on the coordinating plans of work of scientific research institutes and the conclusion of economic contracts with institutions and enterprises, as the experience of the implementation of intersectorial scientific and technical programs shows, is also ineffective. In a certain sense an intermediate version, in conformity with which the organ of management of the interbranch scientific technical complex, which

does not have all the organizations of the complex subordinate to it and is given the necessary rights in the area of plan coordination, the disposal of resources, stimulation, and monitoring, is efficient. At the same time the extent of these rights, which imposes certain limitations on the activity of the organizations of the interbranch scientific technical complex and ensures thereby a greater or smaller degree of their integration in the complex, can differ for different groups of organizations.

The activity of the first group of institutions and enterprises of the interbranch scientific technical complex (which are a part of it) in the area of work, which is connected with the accomplishment of the tasks of the complex, should be planned, financed, and stimulated by the organ of management of the interbranch scientific technical complex. Obviously it is advisable to include in this group organizations and enterprises of not only the head, but also other ministries and departments, who activity determines the results and the time of solution of the problem that has been set for the complex. The scientific research institute, the scientific production association, and the design bureau, which perform the most important difficult stages of the work, as well as the institutions and enterprises, which in case of refusal, the violation of the terms of the contract, and so forth, cannot be replaced by other performers. These are, for example, enterprises, which have unique equipment, on which a product can be produced in accordance with individual orders of the complex, are grouped with them. It is also natural to group with the organizations, which are a part of the interbranch scientific technical complex, such ones, an overwhelming amount of the work of which is connected with the complex (which work mainly on the assignments of the interbranch scientific technical complex).

As to the other enterprises and organizations, the products and services of which are necessary for the accomplishment of the tasks set for the interbranch scientific technical complex (which are participating in the work of the complex), their "connection" can be carried out in accordance with generally accepted procedure. The assignments on the supply of the complex with material and technical resources and on the performance of specific jobs should be included in the plans of these performers, economic contracts should be concluded between the organ of management of the interbranch scientific technical complex, between the institutions and enterprises, which are a part of it, and these organizations. At the same time to avoid possible violations of the established contracts, which can lead to the failure to fulfill the tasks of the complex, which are of great national economic importance, the provision of the conditions for the greater economic interest and responsibility of the members of the interbranch scientific technical complex is necessary. Such conditions can be created, for example, by the singling out of the results of the work on the assignments of the interbranch scientific technical complex in the total amount of work, which is

being performed by one organization or another, the granting to the members of the complex of the right of access to the center of the collective use of instruments, and the additional stimulation of the performers from the centralized funds of the interbranch scientific technical complex.

It should be emphasized that the enlistment of organizations and enterprises in the work of the interbranch scientific technical complex can be carried out not only in an administrative manner, but also on the basis of competitions of plans of the solution of scientific and technical problems and of the development of new types of equipment and technologies and competitions of innovations. A victory in such competitions should become the most prestigious form of the recognition of the scientific and technical maturity of the organizations which developed the plans. These organizations could, in particular, be given the additional rights of the establishment of the remuneration of the labor and the stimulation of the performers and the receipt of the necessary information and scarce equipment from the funds that are created at the interbranch scientific technical complex.

Let us turn now to the questions of the planning and management of the activity of interbranch scientific technical complexes. The existing procedure envisages the formulation of unified five-year and annual plans of their development and the priority allocation by the corresponding ministries and departments (organizations of which are a part of or are participating in the work of the complexes) of manpower, material, technical, and financial resources and limits of capital investments and planning, surveying, and contractual work, which are necessary for the fulfillment of the assignments of the unified plans. The establishment of the complexes was also accompanied by certain changes in national economic planning. Thus, in the state plan for 1986-1990 the special subsection "New Generations of Equipment, Technology, and Materials, Which Are Developed by Interbranch Scientific Technical Complexes" was introduced for the first time in the section "The Development of Science and Technology" [1, No 17].

However, as the experience of the work of interbranch scientific technical complexes shows, the indicated important and timely steps still did not promote the complete assurance of the necessary economic organizational unity of the complexes. Along with the problems, which are specific to each interbranch scientific technical complex, it is possible to distinguish a number of common, typical difficulties in their activity, which are hindering the achievement of the basic goal of their establishment—the significant shortening of the duration of the cycle of operations from scientific research to the practical introduction of its results in the national economy.

At a number of complexes considerable difficulties arose with the compiling of unified plans of development and with the reflection of their assignments in the plans of the organizations and enterprises of the interbranch

scientific technical complexes. An efficient economic mechanism of interaction between the complexes and the corresponding ministries and departments, including those that are the head ones for the corresponding problems,³ and between the interbranch scientific technical complex and its partners has not been set up. Practical experience testifies to a certain difference in direction of the interests of interbranch scientific technical complexes and the enterprises and organizations, which supply the complexes with resources. Thus, for the development of new types of equipment, which surpass the world level in quality, the complexes need equipment which has been produced in accordance with individual orders. However, the designing and production of such equipment are often unprofitable for the performers. Moreover, considerable time is required for the inclusion of these orders in the plans of the performers.

It is also possible to cite other examples of the difficulties in the work of interbranch scientific technical complexes. In our opinion, their emergence is due not only to the novelty of this organizational form and a number of shortcomings of the prevailing economic mechanism, but also to a certain imperfection of the established procedure of planning and managing interbranch scientific technical complexes. Without dwelling on its detailed analysis, let us examine the basic, in our opinion, shortcomings of this procedure: 1) the complexity of the procedure of compiling and approving the unified plans of interbranch scientific technical complexes; 2) the lack of conformity of the mechanism of the allocation of resources to the specific nature of the work of complexes and to the tasks of their operation; 3) shortcomings of the procedure of the formation of the centralized funds of interbranch scientific technical complexes and the stimulation of the organizations and enterprises, which are a part of them and are participating in the work.

The prevailing forms of the planning of the activity of interbranch scientific technical complexes envisage a multistage procedure of the coordination and approval of the unified plans of the complexes and their reporting to the performers. The unified plans of the development of the complex (the five-year plan and annual plans), which have been drafted by its head organization, are submitted for approval to the USSR State Planning Committee, the USSR Academy of Sciences, and the ministry (department), to whose system the complex belongs, and are approved by the USSR State Committee for Science and Technology. The approved plans are then sent by the organ of management of interbranch scientific technical complex to the corresponding ministries and departments, which report the assignments of these plans to the institutions, organizations, and enterprises, which are the performers of the work. As practical experience shows, such a procedure creates opportunities for numerous adjustments of the unified plans in the process of their coordination, as well as for deviations from the assignments of these plans in case of their inclusion in the plans of the performers. Moreover, the

duration of the multistage procedure of their coordination hinders the realization of the basic goal of interbranch scientific technical complexes—the acceleration of the processes of the development and introduction of innovations.

The procedure of allocating resources also does not conform to the tasks of the development of interbranch scientific technical complexes. The bulk of the resources are allocated to the performed by the corresponding ministries when including the assignments of the unified plans of interbranch scientific technical complexes in the plans of the organizations and enterprises, which are subordinate to them.

A fundamentally new feature of management within interbranch scientific technical complexes is connected with the formation of the centralized funds of the complexes. The prevailing procedure envisages the creation of two types of such funds: centralized bonus funds for the development, assimilation, and introduction of new equipment, which are intended for the stimulation of the collectives of the organizations, which are a part of the interbranch scientific technical complex and are participating in its work, and centralized currency funds—for the purchase of scientific equipment, instruments, materials, and so on [2, No 4]. The settlement in principle of the question of the formation of these funds is undoubtedly a progressive undertaking. However, the procedure of forming centralized bonus funds, which has been adopted at present, is not efficient. First, the amount of the deductions for these funds is not directly connected with the magnitude of the economic impact in the national economy of the activity of interbranch scientific technical complexes, that is, with the indicator of the economic impact from the production and use of the new equipment and technology, which have been devised in accordance with the developments of interbranch scientific technical complexes. Second, not the assets of the users of the "results" of the work of interbranch scientific technical complexes, but the assets, which are deducted by the organizations, which are a part of the complexes and are participating in their work, and by the corresponding ministries from their own bonus funds, serve as the sources of these funds. Thus, the basic principle of stimulation—the connection of the amounts and forms of the incentive with the end result of the work—is not being observed.

On the basis of the generalization of the experience of the operation of complexes, the analysis of the prevailing procedure of their management, and the results of research efforts on the questions of program planning and management, it is possible to formulate a number of suggestions on the improvement of the forms and methods of the planning and management of interbranch scientific technical complexes. The essence of these suggestions, which are aimed at the assurance of the economic organizational unity of complexes and at the creation of conditions, which ensure the successful fulfillment of the tasks of interbranch scientific technical complexes, reduces to the following.

First of all the already gained experience of the work of complexes shows that interbranch scientific technical complexes should become independent objects, "addressees" of national economic planning. This assumes that the assignments of state plans on the development, introduction, and assimilation in production of new types of equipment, technology, and materials and on the conducting of basic and fundamental scientific research work or the state orders for their realization should be established not for each of the ministries and departments, which are forming interbranch scientific technical complexes, but for one complex or another as a whole. Limits of resources, which are earmarked in the national economic plan for the solution of one scientific and technical problem or another, for which a complex is established, should also be established accordingly for the interbranch scientific technical complex. Here the organ of management of the complex acts as the holder and manager of the allocated resources.

In case of the changeover to the system of state orders the following procedure of the planning and management of the activity of the interbranch scientific technical complexes, which are being established for the implementation of long-term all-union scientific and technical programs, is possible. Such a program, which is formulated for the entire period of the solution of a specific scientific and technical problem (that is, for 15-20 years), defines, as was indicated above, the concept of the establishment and operation of the complex and encompasses the entire cycle of work being performed by it—from basic research to the assimilation of the new types of equipment, technology, and materials, which are being developed by the interbranch scientific technical complex. On the basis of the target indicators of this program for the period of the next five-year plan the USSR State Planning Committee draws up a 5-year state order for the interbranch scientific technical complex, which specifies the basic assignments on the conducting of basic research and on the development, introduction, and assimilation of equipment of new generations, as well as the limits of the resources that are allocated in a centralized manner to the interbranch scientific technical complex. On the basis of the state orders and the economic contracts between the organizations, which are a part of the complex, and "outside users" (these contracts involve the implementation of measures on the solution of a problem) the head organization of the interbranch scientific technical complex compiles a unified five-year plan of the operation of the complex. The annual plans of the complex include the assignments of the unified five-year plans for the corresponding year, which have been specified with allowance made for the results and scientific and technical achievements, which were obtained during the preceding year. After the drafting of the unified five-year and annual plans the organ of management of the interbranch scientific technical complex or on its instruction the head organization of the complex concludes with the institutions and enterprises, which are a part of the complex and are participating in its work, contracts for the conducting of scientific

research work, for the delivery of the necessary equipment and materials, for the making of an expert appraisal, and so on.

Since interbranch scientific technical complexes are established for the solution of especially important, priority scientific and technical problems in the shortest time, the organs of management of the complexes should be given sufficient rights and powers. The rights in the area of plan coordination were spoken about above. In the area of the disposal of resources it is advisable to give the management of the interbranch scientific technical complex the rights to create of centralized funds and reserves and to purchase the necessary types of materials and equipment from foreign firms at the expense of the currency funds which are formed in the complexes. It is also necessary to grant the management of the interbranch scientific technical complex rights with respect to the stimulation of participants and the enlistment in the work on the accomplishment of the tasks, which have been set for the complex, and on the evaluation of materials of any organizations and subdivisions and individual specialists on the conditions of mutual interest. For this purpose the management of the interbranch scientific technical complex should be granted the right to establish significant wage increments for the workers of the organizations which belong to the complex, as well as bonuses for all the participants in development. Here, of course, it is necessary that the amounts of the remuneration of labor and bonuses would be established subject to the amount of the actual economic impact, which the use in the national economy of developments of the interbranch scientific technical complex yields.

As to the questions of the financing of interbranch scientific technical complexes, their settlement is connected with the changeover of scientific research organizations of cost accounting and self-financing. However, both under the conditions of the prevailing system of the financing of sectorial science and in case of its restructuring the formation of centralized financial funds of complexes is an important element of the operation of interbranch scientific technical complexes. Both the experience of the activity of interbranch scientific technical complexes and the results of research efforts on the problems of program management testify to the advisability of their formation [7, 8, 9].

As is shown in [9], the creation of several types of centralized financial funds, which differ in the goals of their formation and in the sources and directions of spending of the assets, is advisable when managing the implementation of comprehensive programs. Applying the principles, which are formulated in [9], to interbranch scientific technical complexes, it is possible to distinguish three types of centralized funds of complexes: those intended for the financing of new construction and modernization (the centralized investment fund), for the financing of scientific research and development, and the centralized economic stimulation fund. The assets for the first two funds would be deducted

from the same sources, from which new construction and modernization and the conducting of scientific research are financed. Thus, the centralized fund of the financing of scientific development, which is conducted by organizations of the interbranch scientific technical complex, could be formed on the basis of budget allocations, which are intended for the financing of basic research and fundamental work, deductions from the centralized funds of the ministries, to which the organizations, which belong to the interbranch scientific technical complex and are participating in its work, are subordinate, other sources of the financing of scientific development, as well as long-term credit, which is granted to the organ of management of the interbranch scientific technical complex. The combination of all these assets into a unified fund, which is distributed by the management of the interbranch scientific technical complex in conformity with the unified plan of the conducting of development, would create the conditions for the shifting resources, which is necessary in scientific work, and the pursuit of the special-purpose principle of financing.

The centralized economic stimulation fund merits special attention. For the implementation of the basic principle of stimulation for the achievement of the end results it is proposed to form this fund not on the basis of the centralization of a portion of the material incentive funds of the organizations of the complex and the centralized bonus funds of the ministries and departments, which are forming the interbranch scientific technical complex, but from the additional planned profit which is derived by the enterprises, which produce and use the new equipment and technology, which were devised in accordance with developments of the complex. The specific questions of the formation of the assets of these funds are examined in [9].

Under the conditions of the cost accounting and self-financing of the bulk of scientific, planning, and design organizations the sources of the formation of the centralized funds of complexes should change. The revenue from the sale to users of scientific and technical developments and models of new equipment and new technologies and from the rendering of scientific and technical services will become the main source here.⁴ After the recovery of the material expenditures from the receipts from the sale of the scientific and technical products of the complex and the meeting of the obligations to the budget, the bank, and the superior intersectorial organ deductions are made from the revenue for the centralized funds. It seems advisable not to set for the complexes standards of the formation of these funds, but to grant the interbranch scientific technical complexes the right to determine the amounts of the deductions independently.

In conclusion let us cite the basic conclusions.

1. Interbranch scientific technical complexes are a new advanced economic organizational form of the integration of science and production, in which great potentials

of the increase of the quality of developments and the speeding up of the process of the development and introduction of new generations of equipment are incorporated.

2. The experience of the operation of interbranch scientific technical complexes testifies to a number of difficulties in their work, which are due both to the novelty of their organizational form and its lack of connection with the economic mechanism that had prevailed and to shortcomings in the organization and management of interbranch scientific technical complexes.

3. The analysis of interbranch scientific technical complexes shows that at present two types of complexes, which differ in the tasks, the nature of activity, and the status of the different members, are operating: interbranch scientific technical complexes, which are close in type to intersectorial scientific production associations, and complexes, which essentially are an organizational form of the implementation of long-term all-union scientific and technical programs. The specific nature of these types of interbranch scientific technical complexes requires different approaches to the organization of their management, to the choice of the centrally planned indicators of their activity, the forms of the disposal of resources, the methods of distributing revenues, and so on.

4. The subordination of an interbranch scientific technical complex to a specific ministry or department, as practical experience shows, complicates the establishment of intersectorial relations between the organizations of the complex and between the interbranch scientific technical complex and its partners. Therefore, the formation of interbranch scientific technical complexes under organs of intersectorial management is advisable. If there is no intersectorial organ which corresponds to the direction of the work of the complex, the interbranch scientific technical complex can be established under the USSR Council of Ministers.

5. An entire set of steps on the improvement of the forms and methods of the organization, planning, and management of interbranch scientific technical complexes is necessary for the assurance of the economic organizational unity of the complexes and the creation of the conditions of their efficient operation. Its most important element is the singling out of interbranch scientific technical complexes as new independent objects of national economic planning. The state order, which contains a set of assignments on the development, introduction, and assimilation in production of new types of equipment and technology and on the conducting of basic research, should be addressed to the interbranch scientific technical complex as a whole. Accordingly the limits of resources, which are necessary for its fulfillment, should be allocated not to the ministries, which form the complex, but directly to the interbranch scientific technical complex.

6. For the successful solution of a priority scientific and technical problem the management of the interbranch scientific technical complex should be given the necessary rights in the area of the plan coordination of the participants, the disposal of centrally allocated resources, the formation and distribution of the centralized funds of the complex, and the enlistment of the necessary organizations and individual specialists. The formation of the centralized economic stimulation fund of the interbranch scientific technical complex on the basis of deductions from the additional planned profit, which is derived by the consumers of the scientific and technical products of the complex from their use, conforms to the principle of stimulation in accordance with the end results.

Footnotes

1. It is easy to see that the interbranch scientific technical complex of the first type is a version of the program complex, which is a set of economic objects which are participating in the implementation of a specific program, while the interbranch scientific technical complex of the second type is a special case of the interbranch complex, that is, a group of sectors, enterprises, and works, which are encompassed by specific relations. In this case these are relations with respect to deliveries of equipment and technology, the training of personnel, the common nature of the used equipment and technology, and so on. In a number of works, particularly [3, 4], the differences between the plans of the development of interbranch complexes and comprehensive goal programs and on this basis the differences of program complexes from interbranch complexes are shown. The corresponding conclusions also apply to the types of interbranch scientific technical complexes.

2. A bottleneck in the development and production of new types of industrial robots is their provision with control systems of the robots. The supplier of such systems, the Ministry of Instrument Making, Automation Equipment, and Control Systems, is using the assets, which have been released for their development, mainly for intrasectorial needs. Other ministries—the Ministry of the Electrical Equipment Industry and the Ministry of the Electronics Industry—are not ensuring the meeting of the needs of the Robot Interbranch Scientific Technical Complex for components [5].

3. For example, the USSR Ministry of the Electrical Equipment Industry, to which the Tekhnologicheskii lazery Complex is subordinate, has not relieved the suggested production capacities from the output of products that are not characteristic of the interbranch scientific technical complex. Due to this the plants cannot properly direct attention to the retooling and preparation of production. While the activity of the complex is acquiring more and more the nature of a "bureaucratic war" [6].

4. Since the principle of cost accounting and self-financing does not apply entirely to scientific institutes which conduct basic research and fundamental development, in the operation of interbranch scientific technical complexes allocations from the state budget should be retained as one of the sources of the covering of current expenses and the formation of centralized funds.

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Problems of Development of Far Eastern Science 18140262 Moscow KHIMIYA I ZHIZN in Russian No 3, Mar 88 pp 15-19

[Interview with Vice President of the USSR Academy of Sciences Academician Viktor Ivanovich Ilichev, chairman of the Presidium of the Far Eastern Department of the USSR Academy of Sciences, and Doctor of Physical Mathematical Sciences Viktor Anatolyevich Akulichev, chief scientific secretary, by KHIMIYA I ZHIZN correspondent A. Iordanskiy under the rubric "The Workshops of Science": "The Far Eastern Department—On Land, at Sea, in Laboratories"; first two paragraphs are KHIMIYA I ZHIZN introduction]

[Text] KHIMIYA I ZHIZN discovered Far Eastern science for itself 10 years ago: at that time a brigade of

staff members and authors of the journal on the invitation of the Far Eastern Scientific Center of the USSR Academy of Sciences made a trip to the Maritime Region and to Sakhalin and the Kuril Islands and told about the scientific assimilation of the region in the major report "The Far Eastern Scientific Center—On Land and at Sea" (Nos 3 and 4, 1977). Since then publications on the works of scientists of the Far East have regularly appeared on the pages of the journal.

Recently a new stage in the development of science of this region began: the Far Eastern Scientific Center was transformed into a department of the USSR Academy of Sciences. The conversation of a KHIMIYA I ZHIZN correspondent with its managers—Vice President of the USSR Academy of Sciences Academician Viktor Ivanovich Ilichev, chairman of the Presidium of the department, and Doctor of Physical Mathematical Sciences Viktor Anatolyevich Akulichev, chief scientific secretary—is devoted to the problems that face scientists of the region today.

KHIMIYA I ZHIZN: In the Far East academic science always dealt first of all with the study of the natural resources of the region. Does this direction remain a basic one in the activity of the Far Eastern Department of the USSR Academy of Sciences?

V. Ilichev: Indeed, the Academy of Sciences has been studying the natural resources of the Far East already for more than 50 years now. In spite of this, there are still very many unsolved problems here. Therefore, the natural history direction, of course, remains a main one for us. But within this direction several new tasks are now also arising.

Take if only mineral resources. Thus far, in essence, only what lies on the surface has been studied here. In the literal sense of the word: the usual methods of geological photography, as a rule, make it possible to identify only the deposits which lie no deeper than 100 meters. During the last five-year plan we jointly with staff members of Primorgeologiya at only two sites of the Maritime Region were able to penetrate deeper and owing just to this provided the mining industry of the kray with raw materials for 25 years ahead. It is necessary, of course, to develop this direction and to develop new, more "far-sighted" methods of prospecting for ores.

Much is also unclear with biological resources. Here, for example, is the most valuable object of fishing in Far Eastern seas—salmon. In recent years fishermen have more than once suffered great losses due to gross errors in fishing forecasts—it was not possible to correctly predict the time of the approach of fish to the fishing regions and the reserves with respect to individual species. Academic science does not deal directly with forecasts, but basis research on the life cycle of fish and their ecology provides a basis for them, and this is an immediate affair of our biologists.

Here precise quantitative estimates are also needed, it is necessary to develop the mathematical simulation of natural processes. This concerns not only biology and ecology, but also the geological sciences and the study of the ocean. Thus far such a direction of research has lagged here, but now it is planned to strengthen it significantly. Perhaps, it is possible to regard this as one of the new aspects of Far Eastern science. Not by chance is one of the three new institutes, which are now being established in our department, the Institute of Mathematics in Vladivostok.

V. Akulichev: Another new direction of our research is the development of technical means of the assimilation of the natural resources of the sea. For this the Institute of Problems of Marine Technologies is being organized in Vladivostok. It will devise, for example, new means of extracting various useful substances from sea water. Another very important problem is the use of renewable energy resources of the ocean. These are the energy of waves, gradient energy, which is connected with the difference in the temperatures of water masses, and the enormous flows of energy, which occur at the mouths of rivers, where osmotic pressure differentials form—they can also be a source of energy. While the institute will also engage in the development of deep-water equipment, including underwater robots.

V. I. Ilichev: It would have been necessary to establish such an institute about 5 years ago. For we have to begin very soon experimental work on the recovery from the ocean bottom of ferromanganese nodules, but here one cannot do without robots, without new instruments, and without unconventional technologies. Some reserve already exists: the first autonomous deep-water devices have been developed, views on the technique of recovering nodules exist. But all these are just the first steps, much work still lies ahead. It is no easier to develop the ocean depths than it is to render space habitable. Here, true, there is not the problem of launching into orbit, but there is water pressure, which is measured in hundreds of atmospheres—space technology does not often have to deal with such pressures. Or the problems of communication and control: you will not pull a cable several kilometers long after you to the bottom, while there is no radio communication under water, there is only an acoustic channel, but a signal travels more slowly over it—the problem of lags arises, as in the case with work with remote space stations....

V. A. Akulichev: Finally, the third new institute is the Institute of Machine Science and Metallurgy in Komsomolsk-na-Amure. There is another new direction: it is necessary to increase labor productivity in industry of the Far Eastern region, and academic science has to undertake this, because there are no sectorial institutes here.

V. I. Ilichev: We have already done something here. For example, the Vladivostok Institute of Automation and Control Processes developed software for the first flexible production system in the Far East at one of the

instrument making plants. This is a lathe section—a line made up of seven automatic machine tools, an automated warehouse, and control and planning programs. Tests are now under way there, and by the time this issue of the journal is published, the line will have been placed into operation. But this is just a separate development—the establishment of the new institute will make it possible to solve such problems on a broader scale.

KHIMIYA I ZHIZN: Thus far you have spoken more about the newly established institutes of the department. But there are only three of them, well, four, if you count the recently established Institute of Space Physics Research in Magadan. At the same time 20 academic institutes have already been working for a long time in the region. Will anything in their activity change with the establishment of the Far Eastern Department?

V. A. Akulichev: We will strengthen and consolidate the existing institutes. Such a process is under way throughout the Academy of Sciences, but it is especially important for us: many of our "old" institutes in reality are still young, it is necessary to bring them up to a modern level and to supply them with first-class equipment.

V. I. Ilichev: I would say more categorically: the inadequate development of the material and technical base is very greatly hindering Far Eastern science, this is now the main obstacle to growth. It is necessary to solve the problem on the scale of the entire academy. There are not enough modern domestic instruments and equipment; if there is something somewhere, it is single specimens, while the bulk of the equipment is imported. It is necessary to develop quickly our own scientific instrument making.

Here, in the Far East, the situation is also being complicated by the acute shortage of laboratory space. The construction of institutes is proceeding very slowly, from year to year the plans are not being fulfilled. The Pacific Ocean Oceanology Institute, for example, has existed now for 14 years and to this day is dispersed among 40 addresses of Vladivostok, including in basements and lofts, while last year they temporarily halted the construction of the new building. In Khabarovsk the building for the Institute of Economic Research has been under construction already for 8 years.

Of course, this is creating great difficulties. It nearly always happens as follows: a young, talented scientist is work, he is working well; now he has defended his doctoral dissertation, it would be necessary to develop the theme further and to give him a laboratory, but there is no space, no equipment and resources, and he leaves for Moscow or Leningrad, where he gets all this. That is what kind of a unique personnel turnover we have. This, of course, has a regrettable effect on the results.

KHIMIYA I ZHIZN: Incidentally, Vladivostok scientists, especially young ones, also frequently complain about the disorder of personal services and about the

lack of housing. And also about the fact that they divert very many of them for outside jobs: to agriculture, to city construction projects, even to bakeries—to heave sacks of flour....

V. I. Ilichev: Here things are indeed bad with housing—both in Vladivostok and in other cities of the Far East. The trouble is that there is not enough housing for everyone, and the city soviet executive committees take up to 60 percent of our investments for their own needs. But the situation should improve: during the next five-year plan we are increasing housing construction by three- to four-fold, and this problem will more or less be solved.

While as to agricultural jobs and construction projects, we have calculated: indeed, it turned out that during the past five-year plan staff members of the Far Eastern Scientific Center worked not in their specialty, mainly in agricultural jobs, in all 1.5 years.... The reason is simple: agriculture in the region for a long time was developed extensively, enormous areas are being planted, but there is not enough manpower. There is only one solution here—the intensification of agriculture, its mechanization, the increase of the harvests and the corresponding decrease of the areas, so that there would be enough hands. In recent years something has already been done: for example, combines, which have been adapted to our conditions, have appeared, and several sovkhoses are already rejecting the attraction of additional manpower. But radical changes are still a long way off.

V. A. Akulich: But it seems to me that they are diverting even more of your scientific associates. Especially in Moscow.

KHIMIYA I ZHIZN: They are diverting not only scientific associates.... Now, you see, this theme has diverted you and me from scientific matters proper. The point was that the most sore subject both for the Far Eastern Department and for the entire Academy of Sciences is the weak material and technical base. But what other academywide problems are being felt in the Far East?

V. I. Ilichev: There are also the difficulties of introduction. The problem is not so much a scientific and technical one as an economic one: it is well known that industry itself is still inadequately interested in the use of new technologies. While if there is an interest, the implementation of innovations takes very much time, because enterprises do not have reserve capacities: everything works for today's plan. We hope very much that the attitude toward new developments will change now, when the Law on the State Enterprise has come into force.

Nevertheless we ourselves already attempted long ago to find some forms of effective interaction with production. And we did have some success.

Now, for example, there is a form like this—interbranch scientific technical complexes. But we had begun already about 10 years ago to form something similar, so to

speak, as a voluntary service: we concluded contracts with sectors and adopted coordinated programs—this helped to overcome the organizational difficulties of introduction and to solve the problems of financing. Owing to one such program—the Powder Metallurgy Program—in which the institutes of chemistry and mining participated, we succeeded in introducing this advanced technology on a large scale in the kray. At the Amur Complex Scientific Research Institute in Blagoveshchensk we set up the first engineering and technological center in the Far East—now it, for example, is developing and introducing new methods of hardening working surfaces, which are based on research of the institute in the area of solid-state physics.

If we take the problem of the complete use of biological resources, the following means of introduction is also possible here—the organization of joint works with fishing kolkhozes. For example, in case of the catching of crabs their pinchers go to waste, but there are various valuable substances there, first of all chitin, which many sectors of the economy need. Now the Kamchatka Department of the Pacific Ocean Institute of Bioorganic Chemistry has concluded a contract with the Fishing Kolkhoz imeni V.I. Lenin: the kolkhoz has organized a laboratory and together with chemists is developing a technology of obtaining chitin from pinchers, in order to set up its production. Both foreign firms and our agroindustry have displayed an interest in this product, so that a sales market, obviously, does exist.

V. A. Akulich: But in general, even if we do not speak about the new forms of introduction, in recent years many developments of our scientists have found application. Among the most important ones, for example, is an integrated technology of ore processing, which the Institute of Chemistry proposed: owing to it the yield of tin was increased by 25 percent and at the same time the production of another five valuable components was set up. Or the work of the Amur Complex Institute on the extraction of finely dispersed gold, which substantially increases its yield. Or the anticorrosion coatings, which the same Institute of Chemistry developed and which are already being used extensively in shipbuilding.

KHIMIYA I ZHIZN: I do not doubt that you could list many more such examples. But you know, it is a pity: many of them deserve not simple mentioning, but thorough discussion. Moreover, I have more than once had occasion to hear from staff members of Far Eastern institutes that finished developments are not finding application just because hardly anyone knows about them. **KHIMIYA I ZHIZN** would like, as far as possible, to help in this—we will try more often to tell about such works of scientists of the Far Eastern Department. But now another question, which concerns another function of science. It is well known that scientists of the Academy of Sciences in recent times have been actively participating in the settlement of urgent questions of the use of nature—such ones as the reversing of northern rivers or the fate of Lake Baykal. Do such questions face the Far Eastern Department—do you have, so to speak, your own Lake Baykal?

V. A. Akulichev: We have any number of "Baykals." For a long time nature conservation measures in the Far East were in the background: immense spaces, few people, only some 7 million—it would seem, what is there to talk about? And in many cases this led to very grave consequences.

Here, for example, is Amur Bay, in essence, a part of Vladivostok, and a very beautiful part, there are both recreation zones and a city beach here. Meanwhile the bay is actively being polluted, the sewage of a huge city is being discharged here without treatment. And now Amur Bay is one of the dirtiest bays in the country. We were forced to set up quickly entire teams of scientists of different specialties—they are studying the situation and should issue recommendations on what to do. It is not a question of returning the bay to its former state—this is already impossible, such a thing does not happen in nature; it is necessary if only to halt the further deterioration of the ecological situation.

V. I. Illichev: Here, of course, much work lies ahead—it is necessary to set up monitoring, to construct models, and to understand the dynamics. Now programs of nature conservation research are being formulated here—for Amur Bay, for the entire Peter the Great Bay, and for the air basin, which in places is also in poor condition. Successful developments of several of our institutes, which here, too, have to assume the functions of institutions of sectorial science, already exist, and these developments are being successfully introduced at enterprises. It is necessary, of course, to expand such work. There is, for example, the idea to establish at academic institutions and higher educational institutions of the kray temporary collectives for the settlement of individual nature conservation questions, and that the enterprises, which pollute the environment, would finance such research.

V. A. Akulichev: Amur Bay is just the closest example, which is, it can be said, near by us. There is also Kamchatka—the basic spawning grounds of salmon are located there, and the mining industry, which is doing strip mining, has done very great harm to them. There is the Amur River—it is already highly polluted, but in recent times the building of large new enterprises, which could greatly increase the pollution, was planned here, and now the question of revising these plans is arising. There are Kolyma and Chukotka—these are tundra, it is very sensitive to any actions on the part of man....

V. I. Illichev: Precisely there, in Kolyma, they mine gold, but after this enormous lifeless dumps, which are reminiscent of lunar landscapes, remain. It is necessary to recultivate them somehow, but this is very difficult; moreover, agriculture in practice does not exist there.

V. A. Akulichev: But it is necessary to say that the Far East all the same was lucky. Now, when its especially active development is beginning, it is clear to the majority of people that it is impossible to destroy nature with

impunity—not only scientists, but also economic managers know this. It is possible to hope that in the end the situation here will be better than it now is, say, at Lake Baykal or in the Volga River basin.

KHIMIYA I ZHIZN: And a last question. The reform of the organizational structure of the USSR Academy of Sciences is now under way. What steps in this area seem to you to be priority ones for Far Eastern science?

V. I. Illichev: A peculiarity of the restructuring of Far Eastern science is the fact that here it fell to such a time, when the period of formation was not yet over. Therefore, it is a question not so much of the sweeping away of some stable structures as of the establishment of new ones, now with allowance made for present requirements. Here, for example, important discussions on the appointment by election of the management of institutes are now under way at the Academy of Sciences. But for us this, in my opinion, is not the main thing. This is important for old institutes, where all the management positions for a long time have been held by scientists of the older generation and young people simply have nowhere to advance. We do not have such a situation, at our institutes, as a rule, there are sufficient reserves for advancement. Another thing is holding us back—I have already spoken about this: the lack of a material and technical base, laboratories, and housing.

V. A. Akulichev: Democratization in the Academy of Sciences, of course, should take place as it is taking place throughout our society—this is necessary and important. But the primary thing in the work of the academy is the intellectual activity of its staff members. And all the organizational steps, which we are taking, should be aimed at increasing its productivity and at creating for people such conditions, under which they could completely show their worth. The impact of restructuring in science will depend first of all on how successful we are in this.

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Stultification of Academy of Sciences Scourged in Akademgorodok

Report With Specialists' Comments

18140256a Moscow STROITELNAYA GAZETA in Russian 21 Apr 88 pp 1-2

[Article by special correspondent V. Veselov: "Not a Hierarchy of Titles but a Community of Minds"; first two paragraphs are source introduction]

[Text] Scientific workers of the Siberian Department of the USSR Academy of Sciences discuss the article "An Alternative" (STROITELNAYA GAZETA, 24 June 1987).

Let us bring to mind what this article was about. Over the course of many years reports regularly have appeared in our mass information media on an antipathy to scientific and technical developments of important national-economic significance. It is clear that this is far from coincidence. Certain general reasons exist which over the course of a certain period of time have prompted essentially identical phenomena of stagnation in different fields of science and technology. One of the reasons could be said to be the monopolism that has developed in the sphere of science. It, in the belief of certain specialists, is displayed in the fact that a group of titled scientists has acquired exclusive power in determination of technical policy for the entire field of science and in presentation of information, evaluations and judgments in state and party organs. And it is using these powers not for general national interests but for group interests. The fate of science and scientists is turned over into the hands of a narrow group of people who have not been appointed by the state and are not chosen by the scientific community. To legalize such a system means to be removed from control of the state of science.

It was decided that all these thoughts, which are expressed in the article, would be discussed in Novosibirsk's Akademgorodok. Why there? Because the rank-and-file scientific workers of the Siberian Department responded to the editorial board's proposal, while tens of letters sent to academicians and corresponding members heading academic institutes in different cities of the country remained unanswered. Chance? Quite likely not. In Akademgorodok, interest has always been high and today is high in particular in regard to acute scientific and social-economic problems. Here there are always clashes of opinion and new ideas are born.

But could it possibly be that the scientific elite, if you will pardon me, simply is becoming hard to please as they say from easy living?

How They Live in Akademgorodok

The average pay of the basic mass of scientific workers of the Siberian Department amounts to less than 200 rubles. Butter and meat are sold here by coupons. Should there be not enough, there is a cooperative store with its own, and you know what kind of, prices. For academy members, personnel of the presidium of the Siberian Department of the Academy of Sciences and doctors of sciences, a special order desk is open, which has given rise to a local anecdote. A little girl asks: "Papa, when will you be an order-desk doctor?"

The residents of Akademgorodok for the most part live in four-, five-story buildings erected at the dawn of the panel-architecture era.

The general style of dress in the city is democratic and simple. Preference is given to home-woven sweaters and jackets. Externally, doctors of sciences cannot be distinguished from a scientific associate. Although, of course, young people are encountered in stylish combinations

reminiscent of commandos after landing and fighting on very broken terrain.

And instead of making an extra ruble by tutoring or some other intellectual occupation, many of the city's inhabitants devote time free from professional engagements (which is, incidentally, very limited) to searches for answer to questions that are of concern to them, both as scientists and as members of society. This occupation only recently was generally considered, on the one hand, useless ("well, what can you change, old man?") and, on the other, dangerous ("they'll expel you from the institute, remember my words"). But in Akademgorodok, even earlier they did not particularly heed the voice of worldly prudence, but now so much the more.

At the first discussion on "An Alternative" at the Institute of Automatics and Electrometry, no less than 200 people attended, not only "local" scientific workers but also people from other institutes. After that, meetings were held at the Institutes of Mathematics, Chemical Kinetics and Combustion, Economics and Organization of Industrial Production.

"Our Task Is to Give the Customer Not What He Asks For But What He Needs"

[**Doctor of Physical-Mathematical Sciences V. Malinovskiy, deputy director of the Institute of Automatics and Electrometry**] He began his speech thus polemically and pointedly. It is understandable that he had by no means in mind the refusal of academic institutes to take into consideration the needs of production but something else quite different. Science must open up basically new paths and develop ideas radically changing the character of the economy. "But when we bring our developments to a potential customer, more often than not he turns his back on them. Sectoral institutes do not want to undertake for realization "others" ideas, and industry is little interested in carrying out revolutionary technical innovations."

[**F. Zhuravel, senior scientific associate (Institute of Automatics)**] For this reason they demand of us introductions of developments. On the one hand, the researcher himself may be interested in the realization of his idea. At the same time, introduction is purely an act of force, presuming the presence of a resistant medium. Once you invent something, then you spend your entire life "introducing," losing your skills and acquiring the character of a troublemaker.

[**A. Petrov, doctor of chemical sciences (Institute of Chemical Kinetics and Combustion)**] We found a way of processing polyethylene medical products coming in contact with the blood. As a result, thrombi are not formed in them. This was confirmed by clinical tests of the country's leading surgical centers. We already have a pilot installation at one plant which is fully included in the existing technological cycle. However, production is profitable, these items are in short supply, and the plant feels no need to improve them. All this has been going on for 5 years. Here is your scientific and technical progress.

[Ye. Kibalov, candidate of economic sciences (Institute of Economics)] The task of science is production of knowledge. Such a process cannot be easily predicted: one searches for something and finds something else, sometimes a great deal of more value. A scientist engaged in basic research should not sit on cost accounting but think. This occupation is by no means useless, as may appear to some. For example, construction science today is completely deprived of its academic part. Following abolition of the Academy of Construction and Architecture, the science became particularly sectoral. That is kind of good: it is easier to introduce innovations closer to production. But something else occurred—the bank of ideas feeding the scientific stockpile was sharply reduced. Scientists are leaving construction science for other fields. The results are evident: we are lagging most strongly in the development of a scientific basis for construction.

From Princess Yekaterina Romanovna Dashkova to Guriy Ivanovich Marchuk, or The Other Side of the Medal

One might have expected that the discussions's participants, as often happens, would concentrate all the fire of criticism on external obstacles to their work. They could say, we scientists of academic institutes are doing everything possible, but the economy is inhospitable to innovations, question it. And this in general is the honest truth. Academic science actually possesses today a vast fund of valuable ideas in different stages of development. Many real enthusiasts exist who try with their bare hands to open up a way for these ideas through a thick layer of indifference and inertia. But who then is indifferent and inert? Only industry, planning organs and narrow bureaucracy?

[V. Malinovskiy] Paradoxical as it may seem, but the existing situation is to a certain extent advantageous for academic science. If not for all of it, still for some part of it. One could cite unfavorable circumstances and use them to conceal creative barrenness and the many-years of absence of impressive results.

[B. Gavrilko, laboratory chief (Institute of Mathematics)] One should not blame the economy for everything. Science itself affects it. It determines to a large degree what happens in the country. Many promising ideas have not survived because of fierce resistance not from Gosplan but from those academicians who saw in them a threat to their position in science.

[Yu. Zavyalov, doctor of physical-mathematical sciences (Institute of Mathematics)] Why has the number of outstanding realized scientific results been reduced so catastrophically?

The reason does not lie solely in the economic stagnation of recent years when demand for scientific production was minimal. The problem is in the very organization of science which has adopted a rigidly hierarchical character. A scientific bureaucracy has appeared, which most

enviously protects its "monopoly to truth." A fetishization of degrees and titles occurred on whose availability both scientific prestige and material well-being depend. And it is easier to receive distinction in the event that you do not make anything essentially new that could "offend" the person or those who have completely monopolized a given field of science. Thus, this time on the academic level, a development that is too original is declared heretical, which automatically blocks the way to its implementation.

[A. Burshteyn, doctor of physical-mathematical sciences (Institute of Kinetics)] The structure of our Academy of Sciences is army-like. The academic "table of ranks" has for its summit the title of member of the Academy of Sciences. This is on the order of general. Such a system came into existence in the 18th century and displayed a striking staying power in regard to the changes that were occurring around it. Both at the time of the president of the Petersburg Academy of Sciences Knyagina Dashkova and today, academicians themselves elect to their ranks members for life, who acquire quite great possibilities to influence one or another sector of science. What happens as a result?

Let us take an optimal variant: A specialist who is number one in his field is elected to the Academy of Sciences. A certain amount of time passes, and he is surpassed by colleagues. He actually becomes 10th, 12th.... But there will be no rearrangement, the picture is frozen. At the same time, the former number one decides as before what directions need to be provided with resources and which ones need not be in view of their lack of promise. It is easy to guess that in the overwhelming majority of cases "his" direction turns out to be promising, while competitive trends do not receive support. Such a system simply does not permit different-minded scientific thinking.

Imagine for yourselves something similar, say for example, in sports. Someone runs a 100-meter race faster than anyone else one season and for the rest of his live occupies the vacant place of a member of the sports academy. Furthermore, this title makes it possible to decisively influence the assessment of the achievements of other sprinters. And they try, and not unsuccessfully, to run faster than their preceptor. But it doesn't make any difference! Thousands of reasons are found not to recognize the results achieved by the "upstarts" or to restore order. Absurd? Yes, in sports....

But This Is How It Looks in Science, or A Small Picture From Life

In 1983, a paragraph appeared in the American journal *ECONOMIC DESIGN*: "On the basis of existing information, the U.S. Department of Defense plans to undertake a 5-year program of development of a 5th generation supercomputer capable of performing 10^{12} (trillion) operations per second. Completion of the program is planned toward the end of the present decade, and its

cost is estimated at 600 million dollars. As an intermediate goal, it is planned to develop a machine by 1986 capable of performing 10^9 (billion) operations per second."

Such a machine actually made its appearance. Why is it needed? Supporters of SOI [expansion not provided] proceed from the fact that the duration of the active flight of intercontinental ballistic missiles can be reduced to 90 seconds. During this time, it is necessary to perform a whole complex of operations relating to their destruction, inasmuch as the aiming system reacts only to the jets of intercontinental ballistic missiles. This means that the electronic control systems must function on the scale of real time, processing a colossal volume of information practically at the same time with the occurring events. This can only be done by supercomputers with a performance capability of not less than 100 billion operations per second.

Such computers will find, of course, worldwide application, for example, in controlling complex technological processes (in atomic reactors and so forth).

Reports on work relating to the development of supercomputers are appearing increasingly more frequently in scientific periodicals. One of their most attentive readers is the engineer designer Aleksey Ivanovich Mishin from the Novosibirsk affiliate of the Institute of Precision Mechanics and Computer Technology and his comrades from the Mathematics Institute of the Siberian Department of the USSR Academy of Sciences. There is nothing surprising in this: back in 1977, A. Mishin proposed a new principle of organizing parallel computer systems—local asynchronous interactions of elements, making it possible to build systems with a theoretically unlimited performance capability for broad classes of algorithms. For this principle and corresponding design solutions, author's certificates were obtained. In cooperation with other specialists, the bases were developed for local computer systems and software.

This work is especially interesting in still another regard. The United States and Japan are ahead of us so far in the development of a cell basis [elementnaya baza] for electronics. It is essential to overcome the lag, but this requires time and very large resources. There is, however, another, parallel route—development of a nontraditional architecture for computer systems. The Novosibirsk scientists believe that even without significant progress in technology, it is possible in a short time by means of the new architecture to bring performance of computers up to 10^{10} – 10^{11} operations per second.

One might think that the proposal would at the very least interest the Department of Mathematics of the USSR Academy of Sciences and the local academic authorities to whom scientists repeatedly turn to. Nothing of the sort, however, occurred. Today, just as 10 years ago,

Mishin and his colleagues are just as far from the desired goal of creating an operating model of a supercomputer. So far it has been impossible to overcome the academic "veto."

"Knowing perfectly well about this, we decided not to deal in general with the bureaucrats of science but to use 'partisan methods.'"

This is from a conversation with representatives of another group of specialists engaged in the development of a domestic supercomputer. The group, as the saying goes, is informal. It includes staff members from several VUZ's and academic scientific-research institutes in the capital. Their scientific approach to the solution of the problem is close to the ideas of the Novosibirsk scientists. But they are trying to accomplish what was planned for the benefit of the Fatherland in a different way.

"We are working underground or, more accurately, semi-underground. Our nearest chiefs have a pretty good idea of what we are engaged in, but they turn a blind eye toward this and even help surreptitiously. After all, this does not interfere with the main work, and, thank God, there are still quite a few decent people among us. But should our undertaking become widely known, things would be much more difficult. For this reason it is better not to give any names."

"How can the newspaper help you under these circumstances?"

"In no way. Although, there may be one: could you bring us and the Novosibirsk people together? We could try to unite our efforts. This is not a matter of priority but of persuasion."

Danger in Delaying (A Popular Latin Expression)

[Yu. Zavyalov] I see a way out of the existing perfectly abnormal situation primarily in broad democratization of science. Within the framework of the Academy of Sciences, democracy exists only at the top for a closed ring of people—academicians and corresponding members. In such a situation, it becomes something quite the opposite—privilege, the right of dealing uncontrolled with the fates of ideas and their bearers. Now here radical changes are required.

[A. Burshteyn] The chief question is allocation of resources for scientific research. It should not be decided on at the top level of the academic hierarchy, as people there are vitally interested in the development of solely "their own" directions, often to the detriment of "others." Financing of science in all countries is a function of state organs, if you please, of bureaucrats. But they make decisions on the basis of independent expert examination after broad professional discussion among specialists and under conditions where representatives of different schools and directions strive to obtain

an order. I think that in this way it is possible to break down monopolism in science, even while leaving the "elite" all its other privileges.

[A. Shalagin, doctor of physical-mathematical sciences (Institute of Automatics)] But their organizational structure has changed in the direction of greater authoritarianism. The role of the director has sharply increased through reduction of the influence of the scientific council, especially in the field of determination of scientific subject matter and personnel affairs. The administrator scientist has acquired the possibility of practically personally determining the value of research studies, assigning preference to his own interests and suppressing alternative directions. Certification has become a powerful tool of his. The director first of all can always form a certification commission of his "own" people. But even in the case of an unplanned result nothing changes: the final word belongs to the director. Incidentally, personnel questions were formerly decided by a secret vote of the scientific council.

[K. Salikhov, doctor of physical-mathematical sciences, Stalin Prize winner (Institute of Chemical Kinetics and Combustion)] I think that at institutes the scientific structure should be separated from the administrative as it has long been customary abroad. The administration is appointed from the top in the usual way and performs purely economic functions while the scientific council, elected by the institute's collective, is held responsible for scientific work. The council has to determine what directions are promising and what ones are not, present to state organs approved themes and defend them before experts (openly and publicly). This is how I see self-management in its general features.

[V. Sheplev, candidate of chemical sciences] It is time to bring the entire organization of the internal life of the Academy of Sciences into accord with the principles developed by the 27th party congress. This is democratization, openness, self-management and electiveness. Is it really possible to consider normal the fact that 50,000 scientific associates, creating the major portion of the Academy of Sciences' production, not only actually but even formally are deprived today of any sort of right of a voice in affairs directly pertaining to them? In the 1935 charter of the USSR Academy of Sciences it was noted: "The Academy of Sciences consists of members (academicians), corresponding members and a **basic staff of scientific associates working in institutions of the Academy of Sciences.**" The part of this statement in bold type was omitted in the charter adopted in 1963. Thus, the USSR Academy of Sciences today consists only of academicians and corresponding members. Are such necessary changes in the organization possible under the existing administrative-bureaucratic system, the leadership of which is largely responsible for our lag in a number of directions of the newest technology and science-intensive production?

[V. Zarko, doctor of physical-mathematical sciences (Institute of Kinetics)] It seems to me that in a number of cases the necessary democratization in academic institutes can and must be carried out without any instructions from above. Here is a concrete example. In accordance with the new statute, collectives of laboratories are granted the right to elect their chiefs, but...with one exception. This applies to members and corresponding members of the Academy of Sciences who are not by their coworkers to the position of chiefs of laboratories but are appointed by directors of the institutes. There you have a curious correction inserted into the democratic process by the academic authorities. A general party meeting of our institute did not agree with it and unanimously recommended to the administration not to make exceptions in the case of a good rule. Academician Yuriy Nikolayevich Molin, the institute's director, agreed with the opinion of the communists.

[L. Efros, candidate of technical sciences (Institute of Automatics)] A flagrant disparity has developed in the character of the work of a scientific worker through the system of production relations foisted on him. The acquisition of new knowledge is specific intellectual work which has always possessed an especially individual character or in an extreme case was carried out by a small group of specialists who were quite compatible with each other (in essence, an *artel*). A group consisting of two to seven persons is a natural creative cell in any scientific or design organization. For each such group there should be created adequate conditions of productive activities and the possibility of natural organizational division, fusion or temporary association in a larger structure and even self-liquidation. But the existing structure, rigidly regulated and determined from "above," of present scientific-research institutes and design bureaus not only constrains the freedom of formation of the required organizational forms but also ruins creative initiative, destroying everything in embryo which could objectively require a modification of the existing administrative-management system. Scientific associates cannot work effectively in any other way than under conditions of self-organization.

[V. Getmanov, scientific associate (Institute of Kinetics)] Democratization is a powerful normalizing factor for all academic life. The existing system does not stimulate the scientific search but rather a struggle for promotion on the hierarchical ladder. Moral costs in this are quite great: personal and group interests come into deep contradiction with national ones. As a result, not only is the road blocked to alternative directions but wasteful and even outright harmful developments and projects receive active support. This is very serious. In order to determine the direction and character of restructuring in science, it would be useful in my view to convoke an all-union congress of scientific workers that would work out in a democratic way recommendations reflecting the opinions and expectations of the majority of the people engaged in our country in this sphere of activity.

Scientist Biologist on Above Report

18140256a Moscow STROITELNAYA GAZETA in
Russian 21 Apr 88 p 2

[Commentary by scientist biologist Professor A. G. Malenkov; first paragraph is source introduction]

[Text] Scientist biologist Professor A. G. Malenkov, who in recent years has paid a great deal of attention to problems of organization of science, comments on the report on the meetings in Novosibirsk's Akademgorodok.

In my opinion, it is quite right that the majority of the participants in the discussion see the main reasons for the unfortunate situation in science not only in external circumstances but also in the internal features of the scientific community.

The dislike of nontraditional scientific ideas and the inhibition of corresponding developments on the research level constitute a strategically dangerous phenomenon for the country's economic development. It is easy to reject an idea for any plausible pretext as long as its sole bearer is the author and it is still inadequately validated experimentally. A large arsenal of discoveries has been accumulated whose realization would ensure a qualitative jump.

Unfortunately, the situation for reception of revolutionary ideas continues to be extremely unfavorable. New ideas articulated not only by young researchers without titles but also by well-known scientists are actively held back by representatives of the bureaucratic stratum of science. Our science cannot effectively develop under conditions where the intervention of the CPSU Central Committee and the government is required, as frequently is the case.

The scientific community in our country is organized strictly hierarchically similar to the government apparatus. Whereas there such an organization in general corresponds to its functions, it is different for science, which constitutes in essence a holographic system, in other words, an association of minds. This results in total incompatibility between production relationships and the character of productive activity. The ignoring of this law will always have to be paid for....

A researcher or a collective of scientists must be remunerated and valued on the basis of the results of a concrete piece of work rather than depend on the position occupied once and for all time on the hierarchical ladder. The work of a scientist is comparable to the work of a horticulturist or a forestry expert or a leading farm in an area of risky farming. Taking this basic position into consideration, we should organize a system of material and moral incentives as well as accountability.

The low ethical level of the scientific environment is an extremely big hindrance to fruitfulness of work by the scientific community. Restoration of a high moral atmosphere in the scientific environment is not a simple task. It demands civic courage on the part of every scientist and an uncompromising attitude toward pretence and baseness. But the scientific community has the right to count on real support from our party in this matter, which is most important for science and the country. The use of democratic procedures would make it possible to speed up replacement of officials who have compromised themselves in science and who had received their high posts and regalia during the period of stagnation.

It is necessary to facilitate the procedure of forming creative collectives aimed at the solution of socially useful tasks, to introduce financing at least for some part of scientific research on the basis of a system of "grants," that is, temporary subsidies for concrete aims and to permit departments and industrial and agroindustrial associations to give such "grants" without any additional official signatures.

A proposal to the effect that a manager-administrator should be at the head of a scientific institution, while the scientific administration of the work of the institute should be in the hands of a major scientist heading the scientific council (without fail, an elective position), seems very reasonable. All this would help ensure conditions under which the new and progressive would out in an honest struggle those who have had their day and now hinder forward progress.

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Moldavian VIZIR Scientific, Technical Cooperative

18140263 Moscow EKONOMICHESKAYA GAZETA in
Russian No 9, Feb 88 p 14

[Article by S. Yurakov under the rubric "Photo Story of the Issue": "VIZIR Takes Bearings"; photos by A. Shchukin (TASS); photos not reproduced]

[Text] In the name of the VIZIR Scientific and Technical Cooperative attached to the Moldavian Republic Council of the All-Union Society of Inventors and Efficiency Experts its goal is also encoded: the introduction of inventions and efficiency proposals. The cooperative and its 10 affiliates in large cities of the country are rendering enterprises diverse and technical, patent, and license services and are releasing information sheets, posters, and films.

VIZIR united on a contractual basis more than 500 specialists, among them are 135 candidates and doctors of sciences.

Such a high concentration of "minds" enables the members of the cooperative to substantially increase the productivity of engineering labor and to decrease the

time of completion of technical and technological developments. For example, a temporary creative collective of VIZIR made up of four specialists, which design engineer A. Kozhushnyak heads, completed in just 3 months the development of a most complex manipulator with micro-processor control for a detonation gas gun for spraying a strengthening coating on the blades of aircraft turbines. Moreover, the developed equipment surpasses the world level, and firms of the FRG and Japan have already purchased it, U.S. manufacturers have ordered 100 sets.

The large amount of experience of the specialists of temporary collectives makes it possible when developing new equipment to omit the stage of the conceptual design, to avoid lengthy consultations and discussions in various instances, and to begin immediately the making of the working drawings. At the same time, without waiting for the drawing up of the entire set of technical specifications, they produce the necessary parts, and by the time of completion of the working drawings the assembly of a prototype is also being completed.

The enormous leap in the growth of labor productivity became possible owing to the creative search for advanced methods and techniques of its organization. While the material stimuli in VIZIR are considerable: the average monthly wage of the specialists, who work on contracts, comes to 300 to 400 rubles, while, in addition to the basic wage, in all another 6,000 rubles from the profit in accordance with the results of the year were also credited to the 21 staff cooperative members.

The nearly 200 inventors, who are members of the cooperative, are the authors of 1,500 inventor's certificates and patents. When introducing their inventions with the assistance of VIZIR, they can count on 2-percent deductions from the derived annual economic impact. But not only material interest is attracting inventors to the cooperative. Whereas previously they had a hard time with the drawing up of an application for an inventor's certificate, the making of the rounds of instances, and the getting of approval on various types of documents, now the patent and license service of VIZIR has assumed this trouble. Whereas before one often had to spend one's own money for the production of a prototype, now the cooperative pays these expenses.

The services of VIZIR are also advantageous for client enterprises. Losses from inflated staffs of management personnel have been eliminated in the cooperative, which is yielding an enormous saving. Thus, for example, the overhead in the cooperative is only 8-12 percent of the wage fund. The large demand for the services of the cooperative is explained by the quickness of the filling of orders with the high quality of their completion. In 6 months of last year it received orders for nearly 1.5 million rubles. While since the beginning of 1988, under the conditions of the operation of enterprises on full cost accounting and self-financing, their interest in the quickest and economical introduction of new highly efficient equipment has especially appeared. And during January alone the amount of the orders to VIZIR came to nearly 3 million rubles.

Photo Captions

1. Top. The discussion of a new technical idea.
2. Left, middle. Doctor of Chemical Sciences P. Kintya familiarizes agronomist V. Motovilov of the Termalnyy Hothouse Combine of Kamchatka Oblast with the introduced technology of using biologically active substances of natural origin.
3. Left, bottom. Cooperative member M. Kitik carries out the adjustment of a robotic complex for the detonation gas spraying of parts of machines.
4. Right, middle. An experiment, which is being conducted by members of the VIZIR Cooperative, is under way in the climate chamber of the biotron of the Moldavian SSR Academy of Sciences.
5. Right, bottom. The developers of the Vektor computer are S. Bolshakov and Yu. Sukhodolskiy, members of the Servis Electronics Cooperative, and Yu. Savva, technical director of the VIZIR Cooperative for problems of information science.

Chairman of Inventors', Rationalizers' Society Interviewed

*18140312 Moscow SOVETSKAYA ROSSIYA in
Russian 8 Jul 88 p 1*

[Interview by G. Podlesskikh with Yevgeniy Tyurin, chairman, VOIR Central Council: "Application Takes Priority"]

[Text] It is noted in the CPSU Central Committee Theses that large-scale work to convert enterprises to cost-accounting, progressive forms of organization and labor incentive and labor collective self-management are freeing the people's initiative and inducing them to work with maximal output. Favorable economic conditions are being created for inventors' work. The ranks of rationalizers and inventors are growing. However, at the present time effective mechanisms still have not been found for the mass involvement of people in implementing technical progress. How could the creative energy of innovators be better and more productively utilized? This is the topic of our discussion with Ye.I. Tyurin, chairman, Central Council of the All-Union Society of Inventors and Rationalizers.

In our readers' letters, for example, that of rationalizer L. Avilov from Zheleznogorsk, one question is very pointedly raised: what do we need the VOIR for, if our inventions and rationalization proposals lie idle on the shelves? RSFSR Goskomstat data also confirms that only 84 percent of the accepted innovations were applied in industry last year. For some reason, VOIR councils never take up the problems of a specific innovator and the lion's share of time and energy of the activists and staff workers is spent in ensuring a formal increase in quantitative indicators. Why do the technical creative work staffs so unrestrainedly pursue gross output?

To a significant extent, this is due to the fact that we have tried in vain to succeed everywhere. After all, what was the situation until recently? A resolution would be issued for the production of national consumer goods, and right away there would be a plan of measures for the VOIR organizations. Next—protecting the surrounding environment. Once again, we have tasks. Labor protection and safety equipment—there we are, again and again. So it goes, on to infinity. Today, the general trend is primarily to assist inventors and rationalizers, to defend their rights and to extensively develop the cost-accounting activity of VOIR organizations and rivalry in creating and introducing innovations.

Let us be specific. One of our readers from Budennovsk, B. Akhpolov, reports that for a long time an effective device which he and his comrades proposed has not been applied in industry. It provided significant savings when tested on 450 wells. However, the manufacturing plant, although it has praised the invention, refuses to produce it, since this would necessitate production re-tooling. In what way can the VOIR assist here?

Many effective technical innovations, which industry has stubbornly rejected for a long time, have been included in plans at diverse levels due to our society's suggestions. However, frankly speaking, today this type of situation is virtually a dead-end. Therefore, the recent VOIR congress noted that it is extremely important to improve moral and material incentives for specialists who promote the implementation of inventions, and to connect it to the final result—efficiency, quality, reliability and durability. The system existing today cannot stand up to criticism. Specialists should be interested in applying an innovation in precisely the same way its author is. It is necessary to increase the incentives for manufacturing enterprises which set up mass production.

Senior scientific worker S. Krasnogolov from Kapustina Yara, Astrakhan Oblast, suggests introducing criminal liability for damages caused to the state and the inventor due to groundless delays or a refusal to issue an authorship certificate, red tape in application, and so forth. What is your attitude towards making the legislation stricter in such a manner?

I think that material profit is a much more powerful incentive. Economic restructuring and the conversion of enterprises to cost-accounting and self-financing are forcing producers to strive for close cooperation with inventors.

Today, the innovators' movement has the necessary legal, organizational and financial conditions for developing cost-accounting. A resolution has been passed which makes it possible to set up temporary creative collectives under the VOIR organizations, which, without exaggerating, are drawing tremendous interest. For example, the Moscow Oblast VOIR Council recently created such collectives, and this year they have already concluded four contracts totaling 112,000 rubles. One of these has finally provided a real basis for developing arched tooth gearing, which had been approved by the USSR Council of Ministers Buro on Machine Building last March, the application of which will make it possible to increase the resources of diesel locomotives by a factor of 1.5-2. Over 120 temporary creative collectives are at work in Volgograd, Kemerovo, Surgut and a number of other cities in the country.

What developments by independent authors have recently been applied in industry?

Not long ago, in Arkhangelsk, the VOIR Central Council, jointly with the DOSAAF Central Committee and USSR Minselkhoz mash, organized and carried out an all-union exhibit and contest for amateur all-terrain vehicles using low-pressure pneumatic tires. The exhibit brought to light the population's sharp demand for this type of transportation, especially in the northern regions of the country. In Arkhangelsk Oblast alone, for example, over 4,000 such amateur all-terrain vehicles were built. The more successful models are now being assimilated by industry.

Yevgeniy Ivanovich, the lack of a reliable system for defending their rights and interests greatly disturbs inventors and rationalizers. Understandably, this noticeably restrains the application of innovations.

Today, we have already defined the basic organizational, methodological and financial principles of such a system. Regional legal services are being created everywhere, operating basically on social principles. A department has now been created within the Central Council for defending authors' rights.

As the CPSU Central Committee Theses quite justifiably stated, life calls for more decisive measures to perfect the management of scientific and technical progress and to overcome departmental barriers. I assume that the problems of expanding the scale of scientific and technical creativity and increasing its national economic efficiency will also be discussed at the 19th All-Union Party Conference.

13362

USSR To Join International Nuclear Power Body
18140500 Moscow IZVESTIYA in Russian
10 Sep 88 Morning Edition p 1

[G. Alimov report: "Nuclear Power Stations: Safety Under International Control"]

[Text] The USSR Council of Ministers has adopted a proposal for our country to participate in the new world Association of Organizations Operating Nuclear Power Stations. The proposal on the expediency of joining the association was submitted to the government by the Ministry of Nuclear Power Generation and the USSR State Committee for the Supervision of Safe Working Practices in the Atomic Power Industry.

The idea of setting up this organization came from the physicist Marshall, member of the House of Lords and chairman of the Central Electricity Generating Board of Great Britain. After Chernobyl, the world came to the conclusion that nuclear power does not respect borders, and we can only make it safer together. That is why the producers of nuclear power have decided to pool their efforts on a worldwide scale. Some 130 organizations and companies from 26 countries have already declared their desire to join the association.

This step, in the opinion of specialists, will have far-reaching consequences. The pooling of many countries' efforts will undoubtedly make it possible to direct the nuclear power industry onto a path of more reliable development. It is no accident that the association's draft charter begins with the words: "Mankind will only be able to exploit the advantages of nuclear power if AES safety standards are maintained at the highest possible level."

"This aim has been declared to be fundamental," A. Abagyan, director of the All-Union Scientific Research Institute for AES Operation, says. "By joining the association we, like all the participants, will be taking on substantial commitments. Our country will exchange experience in the operation of AES's and information on their work. It is not only a question of routine situations, but also breakdowns and accidents. The association's member countries will compare, select, and introduce various practical measures to improve technical systems

and equipment and share their achievements in diagnosing and repairing AES systems and experience in training nuclear power station personnel. It is very important that specialists directly engaged in nuclear power generation will be in professional contact with each other. The association will be their business club, so to speak."

[Alimov] Were some people opposed to our country's joining the association?

[Abagyan] Yes, at first we were not in unity. Some people thought we had no place in the association. They were probably frightened by the fact that we have to share information, including information on breakdowns or defects. Those who believed that everything must be discussed openly prevailed. When such information is not available, the conjectures begin. They can, as you know, be of various kinds, but usually they do not correspond to reality.

[Alimov] Have you already begun to exchange information?

[Abagyan] Our institute has now been granted the right to supply this data directly. It was not easy to reach that decision. In the past months were spent on obtaining agreement.

[Alimov] How will the association look organizationally?

[Abagyan] It will consist of four regional centers. A center will open in Atlanta (United States) for the countries of North and South America. The West European countries will be served by the Paris center. The third center will be in Moscow, based at our institute, and will be responsible for Eastern Europe. For the Asian countries, a regional center is to be set up in Tokyo. It is planned to link all the centers to a single computer system. Each will have the right of access to the others' data banks. An accord has also been reached on the exchange of technical visits. A group of experts from one station will have the right to visit any other station without hindrance....

Professor A. Abagyan believes that all this taken together constitutes a tremendous step forward in cooperation among organizations and companies operating AES's. It is proposed to convene the association's founding conference in Moscow at the beginning of next year.

Personnel Problems in Belorussian Science

Personnel of Belorussian Academy

18140262a Minsk SOVETSKAYA BELORUSSIYA in Russian 5 Mar 88 p 2

[Article by V. Bibikov under the rubric "Returning to What Has Been Published": "Who Will Take Over?"; first two paragraphs are SOVETSKAYA BELORUSSIYA introduction]

[Text] The scientific institutions of Belorussia urgently need an influx of fresh forces; this has been repeatedly spoken and written about. Nevertheless at the Belorussian SSR Academy of Sciences over a long period, proper attention was not devoted to the training of the young scientific generation. In particular, the number of Komsomol members here has decreased in the last 6 years to less than one-third.

The report "Is It Easy to Be Young?", which was published in SOVETSKAYA BELORUSSIYA on 7 July 1987, as well as the responses of scientists to it, which were published on 16 August and 17 November of the same year, were devoted to the problem of the "aging" of Belorussian science. The newspaper is continuing the discussion on this theme.

The problem of the rejuvenation of scientific personnel at the Belorussian SSR Academy of Sciences is not one of those which it is possible to solve by a cavalry charge. As much as one would like to, it is impossible in 1 hour to train a highly skilled young scientific generation, and those, who need replacement, are not iron equipment, but living people who are worthy of respect. Therefore, the editorial board did not expect reactions after the pattern "it has already been done" to its publications. The strategy of the steps, which it is planned to take in the next few years, was of far more interest.

In part this system is visible from the response of the party committee of the Belorussian Academy of Sciences. An expanded meeting of the party committee of the Belorussian SSR Academy of Sciences, at which steps on the improvement of the work with scientific personnel for the period to 1990 were specified, was held. Steps are being taken for a 5-percent annual decrease of the age of the scientific research staff and the creation of prospects for the advancement of personnel. The formation of their reserve for promotion is being completed. The restructuring of the work of personnel services is being carried out, the professional level of workers is increasing.

The role of communists in scientific councils when settling personnel questions is becoming more conspicuous. Reports of the communists, who are carrying out the scientific supervision of graduate students and degree seekers, on the training of scientific reinforcements and so on have become a part of the practice of the work of shop party organizations.

Steps are being taken to improve the material and everyday aspect of the life of young scientists. A dormitory of the Belorussian SSR Academy of Sciences for 600 was built, which made it possible to provide young specialists with living space. The Presidium of the Academy of Sciences addressed to directive organs of the republic a request on the construction during the 12th-13th Five-Year Plans of 3 kindergartens, a Pioneer camp, a sports complex, the republic House of Scientists, a polyclinic for 600 visits a shift, and a 200-bed inpatient hospital and on the increase of the limit of state capital investments in housing construction. A program of the construction of housing using its own resources was formulated.

Here it should be recalled that in accordance with a decision of the CPSU Central Committee, the All-Union Central Council of Trade Unions, and the All-Union Komsomol Central Committee as of 1 September 1987 the stipend for graduate students was increased to 110-150 rubles a month. It is permitted to register in Minsk young gifted specialists, who are sent in accordance with the decision of the scientific councils of higher educational institutions to work at academic scientific institutions, and young scientists who successfully complete graduate studies.

Nevertheless the problem of recruitment for graduate studies remains urgent. On 1 September of last year, only 205 applications has been submitted for 222 vacancies. In a number of specialties there is no competition. New stimuli for speeding up the training of personnel of the highest skill—doctors of sciences—are required. The housing problem is still be solved with difficulty. Now, for example, about 600 young associates of the Belorussian Academy of Sciences are waiting in line to receive apartments.

The attitude toward young scientists and specialists on the part of the management of the republic Academy of Sciences has changed appreciably, seeing that now it is for the most part also closer to them in age. The Komsomol committee has begun to defend more actively the rights of young people. On its initiative the bureau of the Presidium of the Belorussian SSR Academy of Sciences considered the question of the further improvement of the work with young people and the development of a system of the economic stimulation of scientific institutions in the accomplishment of this task. In accordance with a decision of the presidium the coordinating council of the creative scientific and technical work of young people, which Vice President of the Belorussian SSR Academy of Sciences A. V. Stepanenko heads, was established. A statute on annual competition among scientific institutions of the academy for the best organization of work with young scientists and specialists has been adopted. The winners will be rewarded with monetary prizes and, what, perhaps, is even more important, an additional wage fund for increasing the salaries of the best young scientists will be allocated.

It is proposed also to afford young scientists other opportunities for creative advancement. During 1987-1989, a competition and evaluation of the scientific projects and proposals of young scientists of the academy will be held. The winners will be able to set up creative youth collectives which are equated with structural subdivisions. So, the prospect of actually becoming the head of a sector, or else a laboratory, is very tempting.

But prospects are prospects, while reality, alas, changes slowly. The managers of many institutes and laboratories of the academy as before are not devoting proper attention to the professional and job advancement of young researchers. Now more than 200 candidates of sciences up to the age of 33 are working at the Belorussian SSR Academy of Sciences. However, only two are heads of laboratories, among them there are few senior and leading scientific associates. Young people are being treated especially distrustfully at institutes of the biological and social science types. Here many young specialists with a higher education are working as senior laboratory assistants.

During the discussion in the Presidium of the Academy of Sciences of the report of the director of the Institute of Genetics and Cytology Academician of the Belorussian SSR Academy of Sciences L. M. Sushchenya, academician secretary of the Biological Sciences Department, dwelt in detail on the following aspect of the age problem: With whom is one to replace the doctors of sciences, who become consultants and retire? At one of the institutes 2 years ago the head of a laboratory died, but they never succeeded in finding a specialist of equal level, an entire scientific direction crumbled. It is necessary to undertake the training of young doctors of sciences, who would have ahead time to spare.

So, it is impossible not to agree with this: the problem of "aging" is one of the most important ones. Only why are effective steps for its solution not being taken? Is it either that the powers, which have been placed at the disposal of managers, are insufficient, or is it that they are being used in a limited manner? In any case it is impossible to tolerate the formed situation, for the continuity of generations of scientists may suddenly come to an end. As was reported at a meeting of the Presidium of the Belorussian SSR Academy of Sciences, today of the 305 doctors of sciences only 6 are under the age of 40. About half of the scientists of the highest skill fill the "niche" of 51 to 60, and 84 workers of the academy, who are doctors of sciences, are over 65. Just who will take over?

On 24 February of this year, the question of steps on the development of the Belorussian SSR Academy of Sciences and on the increase of the contribution of scientists to the accomplishment of the economic and social tasks, which were posed by the 27th CPSU Congress, was considered in the Buro of the Belorussian CP Central Committee. In the decree, which was adopted by the Belorussian CP Central Committee and the Belorussian SSR Council of Ministers, in particular, it was noted that

at the Belorussian SSR Academy of Sciences there are serious oversights in the work with scientific personnel, the efficiency of graduate studies is low, and the plans of the training of skilled personnel in priority directions of science and technology are not being fulfilled. Many questions of social development are being poorly settled. The task of increasing its role in the acceleration of scientific and technical progress and the socioeconomic development of the republic and the country was posed for academic science. It will be impossible to accomplish it without the attraction of fresh young forces.

Wage System

18140262a Minsk SOVETSKAYA BELORUSSIYA in
Russian 5 Mar 88 p 2

[Article by V. Dezhko, junior scientific associate of the Institute of Nuclear Power Engineering of the Belorussian SSR Academy of Sciences, under the rubric "Returning to What Has Been Published": "Pay for Labor, and Not for Titles"]

[Text] One of the reasons why young people in science frequently work passively, without initiative, and at times with indifference to the chosen job is the wage of the young scientist, which not only is low, but also does not depend on the results of labor. I know this not by hearsay—since 1979 I have been working at one of the institutes of the Belorussian SSR Academy of Sciences. I believe that you will not solve the problem by increasing the wage, more precisely, salaries. And here is why.

Many representatives of the older generation accuse young people of a mercenary spirit. Once, while still a student, I asked one of our instructors: What does he think of the remuneration of the labor of a scientist?

"We did not ponder over a career and money," he replied. "We simply worked, and that is all. A good salary came as if by itself, with time."

My generation, and not only among the rising young scientific generation, has a different approach to the material aspect of life. No, we do not want to reject for ourselves and our families what the present level of development of production and service makes available to society. But, I will stress, we do not want this free of charge, but in practice by following one of the main principles of our society: if you have worked conscientiously, you will receive accordingly. And whereas I confined myself to discussions on this theme, several people of my own age already during the years as students became familiar with "pilfering."

Unfortunately, the recent decision on the increase of the salaries of scientists in practice changed hardly anything. Whether or not they will increase the wage depends on the certification commission, the opinion of which it is difficult to guess in advance. And the main thing is that

again the remuneration of labor has not been made directly dependent on its results. And, hence, it does not perform soundly enough the role of a stimulus.

The bonus portion of the wage also inadequately ensures it. As a trade union organizer in my day I repeatedly used a document, which had been drawn up at one time at the Belorussian SSR Academy of Sciences. On tens of pages in it there was described in detail which types of scientific products exist and how many points are to be credited for this and that when tallying the results of socialist competition.

On the basis of such a calculation a relatively small amount of money is divided among the scientific subdivisions that took prize-winning places. As far as I know, no conflicts arose with respect to what place fell to whom as a result of counting up the points for reports, technical references, the hours worked during an experiment, and so on. It is another matter when, in addition to simple arithmetic, the strong-willed decision of the board of directors influenced the assignment of places. Then resentments and even secret hostility appeared.

Further, now the quarterly bonus is credited in the amount of a certain percentage of the salary. They can easily give an incentive or punish.... That is about it. But, in general, the bonus of scientists in some way is reminiscent of an advance or the pay: you know in advance the approximate amount. Of course, as a result of such a "percentage" approach low-paid young scientists, even when participating on equal terms with older colleagues in an experiment and the primary processing of the results, receive a smaller material incentive than an associate with an academic degree.

But why not make use of the above-mentioned document of the Belorussian SSR Academy of Sciences when distributing the quarterly bonus? It will merely remain to put down in the title sheets of the jobs, which have been completed by scientists, the coefficient of labor participation of each person, in much the same way as they do when paying the royalty for an introduced invention. There is the ready-made system of the differential remuneration of the labor of a scientists, which has been checked out by practice. It directly takes into account who is working how. It remains to supplement it with a decreasing coefficient for the failure to fulfill the approved plan of scientific work.

Candidates and doctors of sciences are a special topic. For greater skill they receive the corresponding salary and, as a rule, participate simultaneously in several jobs, which should automatically be taken into account by the bonus system in accordance with the sum of the accumulated points. And in order to earn as much as now, some of them will have to greatly increase their work. But, after all, the system of material stimulation should also aim all of us at this.

The only objection that I heard, when conducting a kind of test of the idea among colleagues, consists in the following: jobs of the same level, say, reports, can be of a different professional level. Of course, it is necessary to take this feature into account in some way. In the end, especially controversial situations will be considered by the scientific council of the scientific collective. The bonus system of laboratory assistants and workers of material and technical supply services lends itself just as easily to such revision, so that the individual contribution of each person would be taken into account as much as possible.

In conclusion I will cite an example. Two young engineer-physicists, whom I know well, receive on the average a quarterly bonus of 50 rubles each. They work in the same scientific field, their names appear in the same studies. But one, as they say, himself seeks work, while the other does not display initiative. And if the system of the distribution of the quarterly bonus, which has been proposed by me, were now in effect, my acquaintances would receive, for example, the following: 75 and 25 rubles.

Is it an appreciable difference? It will be even greater and, consequently, will urge on even more strongly people who lack initiative, if the quarterly bonus fund is increased by means of the assets which it is proposed to channel into the increase of the salaries of scientific associates. Then there will appear for young people an effective stimulus to show what they are capable of. Then, I believe, many of those, who today during working time deal with whatever they want, but not science, will also begin to take work home.

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Decree Outlines Improvements for Belorussian Academy of Sciences

18140260x Minsk SOVETSKAYA BELORUSSIYA in Russian 17 Mar 88 pp 1-2

[Decree: "At the Belorussian Communist Party Central Committee and the BSSR Council of Ministers On Measures to Develop the BSSR Academy of Sciences and To Increase the Contribution of Scientists and All Science Cadre in Solving Economic and Social Tasks Put Forward by the 27th CPSU Congress"]

[Text] In approving this decree, the Belorussian Communist Party Central Committee and the BSSR Council of Ministers note that the BSSR Academy of Sciences is making a definite contribution to developing basic research in important areas of the natural, technical, and social sciences. Scientists at the academy have solved several important tasks in mathematics, optics, spectroscopy, materials science, machine and instrument building, the synthesis of new substances, and in genetics and physiology. The most important work won Lenin Prizes and USSR and BSSR State Prizes.

At the same time, the activities of the BSSR Academy of Sciences, its scientific research and design-technological units do not fully meet the demands of the 27th Congress regarding the acceleration of scientific and technical progress and the republic's dynamic social-economic development.

There are no provisions for centralizing efforts and resources on top priority directions in science and technology, this has an effect upon the quality of basic and applied research. As a result, the BSSR Academy of Sciences does not provide support in the extensive introduction of developments capable of revolutionizing production.

The decree states that academy science has only a weak influence upon such key sectors of the republic's economy as machine and machine tool building, information science and computer technology, the chemical and construction industries. There are no noticeable results in solving the most important tasks for the agro-industrial complex, nor are there enough major scientific recommendations for intensive methods in agriculture, the processing and storage of agricultural products, the rational use and protection of natural resources and problems in eliminating the consequences of the Chernobyl accident. Only a small role was given to scientific expertise, consultation and forecasts in working out the comprehensive program for scientific and technical progress in the BSSR over the next 20 years.

There is only a low return from social scientists' research on problems in managing the national economy, in drawing conclusions from the historic experience of working people's struggle to construct a socialist society and in philosophical thinking about the realities of the modern world.

Academy science in oblast centers is not sufficiently developed. It has a weak influence upon solving regional scientific and technical tasks and there is no working collaboration between academy institutions and VUZ's, sectoral NII [Scientific research institutes] and KB [Design offices], associations and enterprises in the republic.

There are delays in perestroyka in scientific-organizational activities at the BSSR Academy of Sciences. Economic methods for stimulating research in priority directions of scientific and technical progress and in solving large intersectoral problems are being weakly introduced. Forms of science-production integration such as temporary creative collectives, engineering centers and support scientific-technical centers for industry have not been widely used.

There are serious shortcomings in work with cadre. The BSSR Academy of Sciences is among the last among republic academies with regard to the percentage of doctors and candidates of science. The annual intake of

young specialists and research trainees is only a little more than 1 percent. Graduate student efficiency is low. Only one out of two finish their education and defend a dissertation.

The facilities available to academy science do not meet contemporary requirements. Scientific research is not supplied with the newest experimental equipment and technology, materials and computer systems. Research is being slowly automated. The experimental production and design-technological base is weak and the academy system has no experimental factories.

Collectives in the BSSR Academy of Sciences are doing a poor job in solving social questions. Year after year the resources allocated for residential and service facility construction are not fully used. There is not a well developed network of preventive health and physical fitness institutions.

The BSSR Academy of Sciences party committee, party organizations at scientific institutions and design offices have only weak influences upon increasing the efficiency of research and upon its rapid production introduction. Businesslike creative environments have not been created at all units in the academy. There are errors in assigning cadre and in controlling administration activities. Communists' personal responsibility for their work is downgraded.

The Belorussian Communist Party Central Committee and the BSSR Council of Ministers demanded that the BSSR Academy of Sciences presidium and party committee take the necessary measures to develop and increase the efficiency of basic research in the most important areas of social and technical sciences. It was deemed necessary to more closely link this to tasks in the accelerated development of the republic's national economy complex, to develop new technology and materials and to see that achievements in the main directions of research meet highest world standards.

In forming the main areas of scientific research in the social sciences and the humanities special emphasis should be placed upon improving the efficiency of economic management, the regulation of economic and labor relations, expanding research on the sociology and history of Belorussia, on national relations and philosophical questions in the development of the individual, collective and society.

The document approved the BSSR Academy of Sciences's main directions for basic research up until the year 2000.

It is stressed that it is necessary to concentrate the efforts of collectives at BSSR Academy of Sciences' scientific institutions and design-technological offices upon solving problems of an intersectoral character, such as information science and computer technology, machine and machine tool building and the agro-industrial complex.

It is suggested to direct special attention towards ecological-economic problems in the rational use and protection of natural systems in the republic, towards resource and energy conservation, the introduction of waste free production methods and towards solving problems connected with eliminating the consequences of the Chernobyl accident.

It was recommended that the BSSR Academy of Sciences and BSSR Gosplan take immediate measures to improve scientific-organizational activities at academy institutions. It is intended to restructure the system for planning scientific research and experimental design work. It is suggested to more extensively use economic methods in creating incentives for scientists and engineering-technical workers to improve research standards, reduce the time required to introduce results and to improve the efficiency with which labor, financial and material resources are used. It also mentions the need to make the economic normatives planned by scientific institutions, design and other organizations in the academy compatible with the new system of economic management.

This year it is intended to begin the transition to the targeted financing of scientific research and experimental-design developments and to extensively use competitive methods in planning and research. It has been decided to develop new progressive ways of organizing scientific research, create more scientific-technical associations, engineering centers and support points at enterprises, centers for the collective use of scientific equipment and to set up creative collectives, including those on a cooperative base, using associates from academy and sectoral organizations and scientists from higher education.

The need was stressed to make the structure of scientific research institutes and design offices and the apparatus of the BSSR Academy of Sciences presidium compatible with new forms for organizing scientific research, scientific support to priority directions in scientific and technical progress and the long term developments of scientific institutions at oblast centers.

Scientific councils and offices of science departments at the academy should have increased responsibility for science support to the republic's economy. There should be strengthened coordination and scientific-methodological leadership of sectoral and VUZ science. It is suggested to expand the representation of scientists at VUZ's, sectoral NII and enterprises at the scientific councils of the BSSR Academy of Sciences.

The decree foresees closer ties between academy science and the republic's economy. By 1995 work done on order from BSSR ministries and departments and all-union enterprises and organizations in the republic should reach 50 percent of total economic contract work.

The BSSR Academy of Sciences should increase its activities in international scientific and technical collaboration, first of all with scientific institutions in CEMA.

There should be more joint scientific research and experimental design work, more temporary collectives of scientists and specialists to solve urgent scientific and production tasks, to train workers and to exchange information. It is suggested that BSSR Academy of Sciences scientists actively participate in research conducted within the framework of the Comprehensive Program for Scientific-Technical Progress in CEMA Countries up until the Year 2000.

There should be improvements in the organization of inventions and patent and license work, in selecting and publicizing patents abroad. It is necessary to substantially expand the commercial sales of patented inventions. By the Year 2000 the number of licenses sold and the foreign exchange earned from them should at least double.

BSSR Gosplan, the BSSR Academy of Sciences and the BSSR Ministry of Higher and Secondary Specialized Education have been given the task of developing a system of measures to improve forecasts in science and technology, developmental tendencies and ways of solving the most important scientific and technical and social-economic problems and the extent to which basically new science and technology will be used in the economy.

It is recommended to more effectively organize work within the Comprehensive Program for Scientific and Technical Progress in Belorussia over the next 20 years, improve the basis for selecting ways of accelerating scientific and technical progress and social and economic development in the republic.

The decree notes that BSSR Gosplan and the BSSR Academy of Sciences should make more precise the Belorussian economy's long term and current needs for science cadre and should support their training. Special attention is to be given to training doctors and candidates of science in priority directions of scientific and technical progress.

It is foreseen that a system of measures will be implemented to select and train young talented students from VUZ's to work in the BSSR Academy of Sciences. Together with the BSSR Minvuz and the BSSR Minpros [Ministry of Education] should work out a program for academy scientists to participate in training specialists, for professional orientation work among school pupils, create educational-scientific-production associations between academy institutes, schools, VUZ's and enterprises. More extensive use should be made of scientific and production facilities at academy institutions to organize educational work by students and pupils and to computerize the educational process.

Jointly with the BSSR Academy of Sciences, party obkoms and obispolkom should take measures to create, in oblast centers and other cities, a potential science cadre capable of solving tasks in the accelerated development of regional economies. It is deemed expedient to

especially control the implementation of programs for the scientific and technical development of oblasts up until the year 2000, closely linking them to the long term development of the republic academy.

BSSR Gosplan, BSSR Gosstroi and the BSSR Academy of Sciences Presidium should take measures to fundamentally improve the equipment available to institutions and organizations in the BSSR Academy of Sciences and raise the efficiency with which it is used. During 1988-2000 it will be important to complete programs for the technical reequipment of scientific research institutions and design-technological organizations in the BSSR Academy of Sciences, giving special attention to the development and manufacture of scientific instruments and nonstandard equipment by academy institutions and organizations and by ministries and departments in the republic. It is necessary to speed up the automation of scientific research.

It is recommended to complete, by 1990, the formation of a network of specialized centers for the collective use of scientific equipment, deepen the specialization of design organizations and experimental production operations and expand the planned production cooperation between them.

It is deemed necessary to work out a program to strengthen the material base of social studies institutes. Jointly with interested organizations, provisions should be made to expand the information and source base for the social sciences, introduce machine methods for processing materials. A quick job printing shop should be set up at the BSSR Academy of Sciences Sciences Department.

The BSSR Academy of Sciences proposals on the creation of scientific research institutes and design organizations and on the construction of new science and science-production facilities were approved.

BSSR Gosplan was entrusted with predicting the necessary limits for capital investments in the "Science" sector; and the BSSR Academy of Sciences with actively using the resources of interested ministries and departments for these purposes.

In order to improve working conditions, medical, living and recreational conditions for academy workers, BSSR Gosplan, BSSR Gosstroi, the Minsk Oblispolkom and Gorispolkom and the BSSR Academy of Sciences are entrusted to support the following construction: housing—at least 60,000 square meters during 1991-1995; 70,000 square meters during 1996-2000; during 1988-200 build 4 kindergartens, during 1991-1995 build a physical cultural complex; a medical-sanitation complex, including an outpatient clinic for 600 visitors per shift, a 210 bed hospital in the Uruche Microrayon; a Pioneer camp for 300 and a recreational area in Minsk Oblast; a House of Scientists and a hotel for 300.

The BSSR Academy of Sciences party committee should see that party organizations at scientific research institutions and design-technological offices play an active role in implementing the decree's measures. It is necessary to improve work with cadre, educate them in a state approach to matters, in responsibility for quality and results from research and constantly teach management workers the skills of working with people under conditions of deepening democracy, widespread glasnost, criticism and self-criticism. It is suggested to take measures to restructure the ideological educational process in collectives at institutions and organizations in the a, to direct communists' efforts towards forming ideological convictions among associates and intolerance towards any deviations from the norms of socialist morality.

BSSR Gosteleradio and the editorial boards of newspapers and journals are entrusted with extensively propagandizing work experiences at the better scientific research institutions, design-technological and experimental production organizations and at the BSSR Academy of Sciences, and to more completely illuminate the creative collaboration with production collectives to accelerate scientific and technical progress.

Paths of the Scientific Quest

The decree approves the main directions for basic research at the BSSR Academy of Sciences up until 2000. These are: algebra, algebraic geometry and number theory, differential equations and the theory of stability; computational mathematics and mathematical modeling.

Among the priority areas are: methods and equipment of laser physics, plasma physics, high temperature superconductivity, elementary particles and nuclear reactions, optics, spectroscopy, the physics of strength and plasticity, heat and mass transfer in heterogeneous and capillary and porous media.

Great attention is given to the synthesis of organic, element-organic and polymer substances, the creation of highly active and selective adsorbents, catalysts and porous materials with specific physical and chemical properties; geology, geochemistry and geophysics of the earth's crust and upper mantle under Belorussia; the dynamics of plant and animal communities in Belorussia, biological basis for their reproduction, their rational use and protection.

Important sections are: the genetic and cellular engineering of plants, animals and microorganisms, the genetic and physiological-biochemical basis of plant selection, productivity and immunity, microclonal propagation methods, molecular and membrane biochemistry and biophysics of photobiological and regulatory processes in cells, physiological and biochemical mechanisms of metabolism and vital activities in animals and humans, depending upon physical and chemical factors in the environment.

The study of the ecological situation in the republic, medical-biological and genetic consequences of radiation, the development of methods to reduce its harmful effects are also among the main directions of basic research.

Great attention is given to problems in improving the legal system of socialism, increase the efficiency of legal regulations concerning economic management and labor relations; the dialectics of development in the needs and interests of the individual, collective and society; problems in expanding democracy and socialist self-management, general patterns and specific features in the history of Belorussia in the pre-October period, the victory of the Great October in Belorussia and the defense of its achievements, the origin of and improvements in socialist society in the BSSR.

A major role is given to studying ethnocultural processes in Belorussia, interethnic material and cultural ties between Belorussians, Russians, Ukrainians and other peoples in Belorussia, patterns in the development of art and its place in the multinational art of Soviet society; problems in the history and theory of Belorussian arts and crafts, literature and language and their ties with the literature and arts and crafts of other peoples in the USSR.

The main directions of BSSR Academy of Sciences research to accelerate scientific and technical progress were approved. These are: laser and plasma technology, the component base for optical computer systems, information technology based upon VLSI, optical-electronic systems, personal computers and fifth generation computer systems.

Also at the center of attention are: methods for creating radio-electronic devices and systems, the development of microprocessors for the automated control of machine tools and equipment; integrated systems for automated design, methods for predicting reliability and means for the accelerated testing of machine components; new materials for electronics, machine building and techniques for producing them using intensive flows of energy and extreme external effects.

Also among the basic directions are: The development of new composite materials, including polymers and metal based composites and waste free technologies for their production and processing; automated devices for measurement, nonintrusive monitoring and control; safety problems in nuclear power engineering, the use of nuclear radiation in the national economy, problems of energy and resource conservation; the creation of technology for using non-traditional renewable sources of energy in the republic. These include: The development of effective technologies for the use of secondary resources, the introduction of waste free production operations in the mineral fertilizer industry, methods and means for the surface strengthening and corrosion protection of metals; the physical-chemical basis of dry methods for the enrichment of sylvinitic ores, for obtaining chlorine free and slowly dissolving potassium fertilizers; the development of membrane technologies,

methods for obtaining and modifying chemical fibers and films, textile fillers, science intensive low tonnage chemical products and catalytic methods for the thorough processing of wood.

Other urgent directions are: mineral exploration in Belorussia, the rational use and protection of mineral resources, the creation of effective equipment and techniques for extracting and comprehensively using peat, sapropel, lignite and shale oil, the ecological-economic basis for the rational use and protection of natural areas during the diversion of waters for economic purposes, the synthesis of substances based upon natural compounds and their biological actions, the creation of new biologically and ecologically safe resource conserving technologies.

Important sections: The microbiological basis for biotechnology of physiologically active substances, the use of microorganisms in agriculture and environmental protection, the development of microbiological methods for fixing atmospheric nitrogen by agricultural crops, the scientific basis for obtaining diagnostic and therapeutic substances for medicine and ecologically safe crop protection; problems in improving the social and economic efficiency of the BSSR economy, the creation of integrated concepts for improving the economic management mechanism and its active influence upon the efficiency of public production, reductions in material and resource intensiveness, improvements in product quality.

Horizons of Development

The decree approves a list of scientific research institutes and design organizations in the BSSR Academy of Sciences to be set up during 1988-1993. This year in Brest there will appear the division of the Institute for Technical Cybernetics, which will develop systems for automated design in machine and instrument building. Special design-technological offices with experimental production operations of the Institutes for Applied Physics and Bio-organic Chemistry will open in Minsk. The Institute for Problems in Ecology will start its biography in 1990. It will study problems in the rational use of natural resources and in environmental protection.

A special design office with experimental production operations for scientific institutions in the Division of Biological Sciences will be put into operation in Minsk in 1990, and in the following year the Division of Chemical and Geological Sciences will obtain a similar unit. In Grodno a narcological center will go into operation. Its task is the comprehensive study of alcoholism and drug addiction and the development of methods in the struggle against them. A materials science institute will open in Mogilev in 1993. New structural materials for machine building will be born here.

Among the main science and science production projects for the BSSR Academy of Sciences to be put into operation this year are: a building for a special design-technological office with experimental production operations at the Physics Institute, an experimental base

for the Physics-Technical Institute, a new typographic shop for the publishing house. Model installations for testing technology to produce new chemicals will be built in 1988-1989. A complex of buildings for experimental production at the Institute for Technical Cybernetics will be completed in 1989. By 1991 it is intended to put into operation a laboratory building for the Physics-Technical Institute and the Biotechnology Institutes in the Biological Sciences Division. A Central Design office with experimental production operations will go on line in 1992 and in 1993 so will a laboratory building for new technological processes at the Electronics Institute.

In 1992 it is planned to build a computer center at the Mathematics Institute and in 1993 a laboratory building with facilities for experiments at the Brest Division of the Institute for Technical Cybernetics and a building for experimental production operations at the Special Design Office of the Institute for Heat and Mass Exchange. In 1994 it is intended to introduce experimental production operations at the Physical-Organic Chemistry Institute and the Institute for General and Inorganic Chemistry, a building for the Special Design Office at the Biorganic Chemistry Institute, a set of buildings for the experimental design base at the Institute for Solid State Physics and Semi-Conductors and a laboratory building at the Institute for Applied Physics.

The laboratories for the Radiobiology Institute and the Institute for problems in Machinery Reliability and Longevity will be built in 1995 and 1996 respectively. In 1997 it is intended to complete construction work on the experimental base and the building for the Special Design Office and Experimental Production facility at the Mogilev Division of the Physics-Technical Institute and the Book Repository at the Central Science Library in Minsk. This same year will see the completion of the laboratory for institutes in the Social Sciences Division, the Computer Center at the Mathematics Institute Division in Gomel and the experimental base for the Institute of Experimental Botany. By the year 2000 it is planned to build an experimental factory for the Physics-Technical Institute and the laboratory-engineering building for the Electronics Institute. Other important new projects are also on the approved list.

11574

General Assembly of Estonian Academy of Sciences

18140266a Tallinn SOVETSKAYA ESTONIYA in Russian 31 Mar 88 p 3

[Article (ETA): "In Science There Is Nothing Secondary"]

[Text] The General Assembly of the Estonian SSR Academy of Sciences, at which the activity of the academy during the past year and the tasks for the current year were discussed, was held in Tallinn on 30 March.

Opening the assembly, Hero of Socialist Labor Academician K. Rebane, president of the Estonian SSR Academy of Sciences, stressed that the February CPSU Plenum was a powerful stimulus for the development of creative thinking, which is aimed at the fulfillment of decisions of the 27th party congress.

During the year under the review the Estonian SSR Academy of Sciences made definite gains in the field of both basic and applied research. About 100 developments were included in the annual report, which was submitted to the USSR Academy of Sciences, 68 applications were made for inventions. Many achievements of members and associates of the academy attracted attention on an all-union scale. A collective of cyberneticists was awarded the USSR State Prize for the development of computer-aided design software and a collective of chemists was awarded the USSR State Prize for the development and introduction of a technology of the production of shampoo from fish protein. During the period under review scientists of the academy conducted research on nearly 100 problems and carried out the elaboration of 233 themes. The following figures characterize the contribution of Estonian science to the rapid development of our country: scientists of the Estonian SSR took part in the formulation of 17 all-union programs and continued the work on the implementation of 18 republic programs, 9 works of organizations of the Estonian SSR Academy of Sciences were included in the comprehensive program of scientific and technical progress of the CEMA member countries.

At the assembly it was said that along with successes in the work of the republic Academy of Sciences there are also serious shortcomings. In several fields the research work lags behind the requirements of the times, at times academic institutions are diverted in a completely unfounded manner from basic research, they are overloaded with the accomplishment of current tasks of a practical nature. The contribution of the Estonian SSR Academy of Sciences to the scientific study of the problems of the socioeconomic development of the republic, including urgent technological and ecological questions, is modest. Unfortunately, the academy proves aloof in case of the preparation of various vitally important, decisive decisions for the development of the republic. The high average age of doctors of sciences and the small increase of scientists of such a level are disturbing. During 1987 only four doctoral dissertations were defended. Questions of construction have become especially sore. The annual plan of construction and installation work was fulfilled by only 48 percent. The situation with housing remains chronically difficult.

The assembly resolved that this year the Estonian SSR Academy of Sciences needs to intensify the work on the fulfillment of the instructions of the party and government. Academic science with the participation of VUZ science should ensure the comprehensive development of basic research in all the most important directions of the life of society and the natural and technical sciences.

It was especially noted that along with basic research it is necessary to devote more attention to the problems of integrated technologies and to the solution of ecological, economic, social, and political problems. It was acknowledged that the Presidium of the Academy of Sciences and its subdivisions need to simplify office work and to reduce paper work.

The assembly approved the report of the Presidium of the Estonian SSR Academy of Sciences on scientific and organizational activity during 1987 and for the most part endorsed the plan of scientific research work for 1988.

The Academician Paul Kogerman Memorial Medals, which A. Kestner, Kh. Timoteus, V. Yefimov, Yu. Lill, K. Urov, and L. Melder were awarded, were presented at the general assembly. Prizes were also presented to the four authors of the best student scientific works.

The assembly approved Yu. Kann as director of the Institute of Chemistry of the Estonian SSR Academy of Sciences.

Secretary of the Estonian CP Central Committee I. Toome, Deputy Chairman of the Presidium of the Estonian SSR Supreme Soviet M. Leosk, and republic Minister of Higher and Secondary Specialized Education V. Rayangu participated in the assembly.

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Session of General Assembly of Kazakh Academy of Sciences

18140261a Alma-Ata VESTNIK AKADEMII NAUK KAZAKHSKOY SSR in Russian No 3, Mar 88 p 3

[Article: "The Session of the General Assembly of the Kazakh SSR Academy of Sciences"]

[Text] A session of the General Assembly of the Kazakh SSR Academy of Sciences, which considered the organizational question, was held on 10 March.

Academician of the Kazakh SSR Academy of Sciences U.M. Sultangazin, vice president of the republic Academy of Sciences and director of the Institute of Mathematics and Mechanics, was elected president of the Kazakh SSR Academy of Sciences.

Chairman of the Kazakh SSR Council of Ministers N.A. Nazarbayev spoke at the session.

First Secretary of the Kazakh CP Central Committee G.V. Kolbin, Secretary of the Kazakh CP Central Committee U.D. Dzhanibekov, N.K. Mukitanov, chief of the Science and Educational Institutions Department of the Kazakh CP Central Committee, and S.P. Gubin, deputy chairman of the Council for the Coordination of the Scientific Activity of the Academies of Sciences of the Union Republics attached to the Presidium of the USSR Academy of Sciences, took part in the work of the session.

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Annual General Assembly of Tajik Academy of Sciences

18140266d Dushanbe KOMMUNIST TADZHIKISTANA in Russian 12 May 88 p 3

[Article by TADZHIKTA correspondent O. Sobolev: "For the Effectiveness of Science Research. From the Annual General Assembly of the Academy of Sciences of Tajikistan"]

[Text] To increase the contribution to the acceleration of scientific and technical progress, to mobilize all forces for this, to strengthen contacts with sectorial and VUZ science, industry, and agriculture—such are the demands of the times on scientists. The participants in the Annual General Assembly of the Academy of Sciences of Tajikistan, which was held in Dushanbe, also discussed their affairs from this standpoint.

Academician Kh. M. Saidmuradov, chief scientific secretary of the Presidium of the Academy of Sciences, delivered the report "On the Activity of the Academy of Sciences in 1987 and the Tasks for 1988."

It was noted that during the year under review scientists of the academy had aimed their efforts at the development of the priority directions of science, the further intensification of research, and the increase of its practical return. The plans of scientific research and experimental work and the adopted socialist obligations in practice were completely fulfilled. Within the framework of contracts on scientific and technical cooperation with ministries and departments and with industrial associations 114 economic contractual jobs in the amount of 3.8 million rubles were completed. In all 25 scientific developments were introduced in industrial and agricultural production. Ten developments, which had undergone pilot industrial checking, were turned over for introduction.

To execute the decision of the preceding annual assembly the presidium of the academy drew up and submitted for consideration to directive organs a draft of the plan of the comprehensive development of the academy for the next 15 years.

At the same time restructuring at the academy is still proceeding slowly, there are no reliable stimuli of the increase of the efficiency of the work of scientific subdivisions and each scientist. There are serious oversights in the planning and coordination of scientific research and the strengthening of the contacts of science with production. The majority of coordinating sections and problem councils are working inefficiently.

The contacts of our academy with the academies of sciences of the republics of Central Asia and Kazakhstan have improved somewhat. Last year the regional problems on environmental protection, fuel, energy, and mineral raw material resources, renewable energy sources, seismology and seismic-resistant construction, and the intensification of cotton growing were specified. The republic academies also planned to concentrate joint efforts on the formulation of the scientific principles of the development of the regional economy, on the study of demographic processes and the use of manpower resources, and on the problems of atheistic and international education.

During the restructuring of the academy for the most part the top levels of the management structure were affected. The certification of scientists took place in part in a formal manner and did not solve the problems of stagnation in personnel policy. Serious difficulties are arising with the reinforcement of institutions of the academy with specialists, especially in very scarce specialties. The effectiveness of the work of graduate studies still remains low. While many academic institutions are not carrying out the purposeful systematic selection of candidates for enrollment in graduate studies. The proportions in the training of specialists have not been observed. The number of people, who were admitted to graduate studies and completed them in the physical mathematical sciences, decreased, while with respect to the historical and philological sciences and other humanities it increased. The material and technical base of scientific institutions does not satisfy the requirements, as before basic research is not finding extensive application.

Practical experience has shown that program planning is the most advanced, economically profitable form of scientific research work. In 1987 institutions of the academy participated in the formulation of nine republic scientific research programs, but the end results of a number of studies were not linked with technical progress in the national economy. This means that the jobs completed by scientists are often dead weight, although much capital and much effort and time are spent on them. It is time to set up a complex expert commission for the selection of urgent themes, which are connected with the acceleration of scientific and technical progress, and to specify the deadline of the completion of research on them and the amounts of material and manpower supply.

The scientists, who addressed the assembly, spoke about the great hopes, which the people and the party are placing in science. Therefore, the main thing now for each worker of science is greater initiative, creative activity, self-discipline, and responsibility. But at such subdivisions of the academy as the Pamir Biology Institute, the institutes of chemistry, oriental studies, and language and literature, and several others executive discipline is still not at its best. A normal moral and psychological climate has not been created everywhere.

In the collectives of the institutes of mathematics, chemistry, and geology conflict situations, which destabilized the work of these institutions, arose. One would like to know: How will these collectives accomplish the tasks in connection with the forthcoming changeover to the new system of the planning and financing of scientific research work in conformity with the state order?

At the assembly Corresponding Members of the Academy of Sciences of Tajikistan G. A. Ashurov, M. R. Dzhalilov, and R. V. Kamelin and Academician B. A. Litvinskiy spoke about the urgent problems.

Deputy Chairman of the Republic State Agroindustrial Committee R. Sh. Zharkov, who addressed the assembly, made the suggestion to increase the number of urgent studies which are necessary for the sectors of agriculture.

Restructuring requires the strengthening of the contacts of VUZ and academic science, said Corresponding Member of the Republic Academy of Sciences F. Kh. Khakimov, dean of the Physics Faculty of the Tajik State University imeni V. I. Lenin, Doctor of Chemical Sciences Kh. M. Yakubov, dean of the Chemistry Faculty of the Tajik State University, supported him.

"More concern about the habitat and about the ecological consequences of the projects being implemented is one of the main demands on the work of scientists," Corresponding Member of the Academy of Sciences of Tajikistan K. Sh. Dzhurayev declared.

The Annual General Assembly adopted a decree, in which specific steps on the comprehensive development of the academy, the revision of the themes and structure of scientific subdivisions, and the increase of the effectiveness of the practical output of research were outlined.

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General Assemblies of Ukrainian Academy Departments

18140266c Kiev PRAVDA UKRAINY in Russian
29 Mar 88 p 3

[Article (RATAU): "The General Assemblies of the Departments of the Ukrainian SSR Academy of Sciences"]

[Text] The general assemblies of the departments of the Ukrainian SSR Academy of Sciences were held in Kiev on 28 March. At the assemblies the results of the activity of the institutions of the republic Academy of Sciences during the past year were examined and the tasks for 1988, as well as to the end of the 12th Five-Year Plan, which follow from the instructions of the 27th party congress and the June (1987) CPSU Central Committee Plenum, were discussed.

In the reports of the academicians secretaries of the departments and in the statements it was noted that the collectives of academic institutions had concentrated their efforts on the restructuring of scientific work. They are striving to expand basic research, to specify more clearly the priorities of scientific research, and to introduce effective scientific and technical cooperation.

The scientific forces of the republic are playing an important role in the accomplishment of statewide programs and orders and the large-scale themes, which are being fulfilled within the Comprehensive Program of Scientific and Technical Progress of the CEMA Member Countries to 2000.

The level and quality of scientific research and experimental design work have increased, the practical use of the results of scientific research has improved. Here the emphasis is being placed on the development and pilot industrial checking of new advanced technologies as the basis of the retooling of production. Interbranch scientific technical complexes and engineering centers have been formed and are being successfully developed. Tens of support centers of institutes of the Ukrainian SSR Academy of Sciences—new subdivisions which are broadening substantially the sphere of application of the results of scientific research—have been set up in various regions of the country.

At the same time the participants in the assemblies spoke about the fact that the level and pace of the restructuring of the activity of the departments of the Ukrainian SSR Academy of Sciences are still inadequate. The reorientation of institutes toward promising scientific directions has not received proper development, in a number of cases their approach to the singling out of the priorities of scientific research remains formal. Well-balanced creative collectives, which are capable of fulfilling difficult tasks and advancing new ideas, have not been formed everywhere. The goal program planning of the work of institutes should be used more extensively. The process of democratization is being developed poorly at institutions of the academy.

Works, a number of which have received recognition, have been completed at institutes of the Social Sciences Section of the Ukrainian SSR Academy of Sciences. At the same time social scientists have to solve serious problems. Today they are still greatly indebted to society. This was discussed frankly at the assemblies of the departments.

Attention was directed to the need to bring the social sciences closer to the real requirements of life. Our conception of the dialectics of productive forces and production relations, socialist property, cooperation, popular self-government and democracy, and the development of social consciousness, culture, literature, and

art needs enrichment. A thorough analysis of the causes of the occurrence and the means of overcoming the negative phenomena, which have hindered social progress, has to be made. Here an abundance of work still faces social scientists. Specific suggestions on overcoming the lag in the development of the social sciences were voiced.

It is extremely important, it was stressed at the assemblies, that restructuring in science not be reduced to superficial, insignificant, cosmetic steps. This requirement is especially urgent for the work with personnel, in which, unfortunately, blunders exist. As was indicated at the assembly of the Earth Sciences Department, they existed, in particular, at the Institute of Geology and Geochemistry of Combustible Materials. An unhealthy moral and psychological climate and the lack of contact of the administration with the party organization led to a decrease of creative activity. The situation improved only after the intervention of the Presidium of the Ukrainian SSR Academy of Sciences and the bureau of the department and the replacement of the management of the institute. The errors in the work with people also showed in the fact that the pilot works and special design and technological bureaus of several institutes of the department remained without a management staff and a ready reserve.

The question of the attraction of capable young researchers to the academy and the rejuvenation of its personnel is now urgent. The importance of such an approach was discussed, in particular, at the assembly of the Physical and Technical Problems of Materials Science Department, the Physics and Astronomy Department, the Mathematics and Cybernetics Department, and the Mechanics Department. The speakers here stressed: it is necessary to promote and support young people more boldly and not to be afraid to entrust them with promising directions. It should be seen to that this work would be just as well supplied with resources and manned with performers as the work which well-known scientists head.

In the adopted decrees specific steps on the fulfillment of the tasks, which face scientists, were outlined and the means of increasing the practical return of their work and of further intensifying scientific research were specified.

Responsible officials of the Ukrainian CP Central Committee and the Ukrainian SSR Council of Ministers and executives of a number of republic ministries and departments, industrial associations and enterprises, sectorial scientific research institutes, and higher educational institutions took part in the work of the assemblies.

Winners of 1988 Lenin Prizes in Science, Technology

18140256 Moscow PRAVDA in Russian
22 Apr 88 pp 1-2

[Decree of the CPSU Central Committee and the USSR Council of Ministers of 15 April 1988 "On the Awarding of the 1988 Lenin Prizes in Science and Technology"]

[Text] Having considered the suggestion of the Committee for Lenin and USSR State Prizes in Science and Technology attached to the USSR Council of Ministers, the CPSU Central Committee and the USSR Council of Ministers resolve:

To award the 1988 Lenin Prizes in Science and Technology to:

1. Candidate of Physical Mathematical Sciences Gurgun Ashotovich Askaryan, senior scientific associate of the Institute of General Physics of the USSR Academy of Sciences, Doctor of Physical Mathematical Sciences Vladimir Nikolayevich Lugovoy, leading scientific associate, Candidate of Physical Mathematical Sciences Vladlen Vasilyevich Korobkin, head of a division, staff members of the same institute; Doctor of Physical Mathematical Sciences Vladimir Ilich Talanov, head of a division of the Institute of Applied Physics of the USSR Academy of Sciences; Candidate of Physical Mathematical Sciences Nikolay Fedorovich Pilipetskiy, head of a laboratory of the Institute of Problems of Mechanics of the USSR Academy of Sciences; Doctor of Physical Mathematical Sciences Anatoliy Petrovich Sukhorukov, head of a department of Moscow State University imeni M.V. Lomonosov—for the discovery and study of the effect of the self-focusing of wave beams.

2. Academician Aleksandr Mikhaylovich Baldin, director of a laboratory of the Joint Institute for Nuclear Research, Doctor of Physical Mathematical Sciences Pavel Nikolayevich Bogolyubov, chief of a sector of the same institute; Doctor of Physical Mathematical Sciences Viktor Anatolyevich Matveyev, director of the Institute of Nuclear Research of the USSR Academy of Sciences; Corresponding Member of the USSR Academy of Sciences Albert Nikiforovich Tavkhelidze, president of the Georgian SSR Academy of Sciences; Corresponding Member of the Armenian SSR Academy of Sciences Rudolf Muradovich Muradyan, head of a group of the Byurakan Astrophysics Observatory—for the series of works "A New Quantum Number—the Color and the Establishment of the Dynamic Laws in the Quark Structure of Elementary Particles and Atomic Nuclei," which were published during 1965-1977.

3. Doctor of Technical Sciences Vladimir Aleksandrovich Teplyakov, deputy director of the Institute of Higher Energy Physics; Doctor of Technical Sciences Ilya Mikhaylovich Kapchinskiy, chief of a division of the

Institute of Theoretical and Experimental Physics—for the development and production of a linear ion accelerator of a new type with beam focusing by a quadrupole high frequency field.

4. Academician Nikolay Konstantinovich Kochetkov, director of the Institute of Organic Chemistry imeni N.D. Zelinskiy of the USSR Academy of Sciences—for a series of works on the synthesis and structure of carbohydrates, which were published during 1962-1986.

5. Academician Yuriy Aleksandrovich Kosygin, director of the Institute of Tectonics and Geophysics of the Far Eastern Department of the USSR Academy of Sciences—for the monograph "Tektonika" [Tectonics], which was published in 1983.

6. Corresponding Member of the USSR Academy of Sciences Leonid Viktorovich Krushinskiy—for the monograph "Biologicheskiye osnovy rassudochnoy deyatel'nosti" [The Biological Bases of Rational Activity], which was published in 1986.

7. Academician Tamaz Valerianovich Gamkrelidze, director of the Institute of Oriental Studies imeni G.V. Tsereteli of the Georgian SSR Academy of Sciences; Doctor of Philological Sciences Vyacheslav Vsevolodovich Ivanov, head of a sector of the Institute of Slavic and Balkan Studies of the USSR Academy of Sciences—for the monograph "Indoeyevropeyskiy yazyk i indoyevropeytsy" [The Indo-European Language and the Indo-Europeans] in two volumes, which was published in 1984.

8. Boris Afanasyevich Galyan, chief project designer of the experimental design and technological bureau of the Institute of Electric Welding imeni Ye.O. Paton of the Ukrainian SSR Academy of Sciences, Anatoliy Andreyevich Toldin, chief of a brigade of the same design and technological bureau; Candidate of Technical Sciences Vladimir Ivanovich Khomenko, head of a laboratory of the All-Union Scientific Research Institute for the Construction of Main Pipelines; Candidate of Technical Sciences Vladimir Grigoryevich Chirksov, USSR minister of construction of petroleum and gas industry enterprises; Nikolay Petrovich Dragunov, superintendent of Complex Pipeline Construction Administration No 4 of the Kuybyshevtruboprovodstroy Trust; Anatoliy Viktorovich Lukin, mechanical engineer—for the development of a high-performance technology and a set of equipment for the resistance welding of large-diameter pipeline systems.

9. Academician Avenir Arkadyevich Voronov, adviser attached to the board of directors of the All-Union Scientific Research Institute of Systems Research of the USSR Academy of Sciences—for a series of works on the theory of automatic control, which were published during 1957-1985.

[Signed] Secretary of the CPSU Central Committee M. Gorbachev

Chairman of the USSR Council of Ministers N. Ryzhkov
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Winners of USSR Council of Ministers 1988 Prizes

18140255 Moscow SOTSIALISTICHESKAYA
INDUSTRIYA in Russian 17 Apr 88 pp 2-3

[Article under the rubric "For Scientific and Technical Achievements": "On the Awarding of the 1988 Prizes of the USSR Council of Ministers"]

[Text] Having considered the representation of the USSR State Committee for Science and Technology and the All-Union Central Council of Trade Unions, the USSR Council of Ministers resolves:

To award the 1988 prizes of the USSR Council of Ministers for the completion of complex scientific research and planning, design, and technological work in the most important directions of the development of the national economy and its sectors and for the introduction of the results of this research and work to:

1. Academician N.A. Logachev, director of the Institute of the Earth's Crust of the Siberian Department of the USSR Academy of Sciences, supervisor of the work, Doctors of Geological Mineralogical Sciences O.V. Pavlov and Ye.V. Pinneker, deputy directors, Corresponding Member of the USSR Academy of Sciences V.P. Solonenko, Doctor of Geological Mineralogical Sciences S.I. Sherman, Candidate of Physical Mathematical Sciences S.I. Golenetskiy, and Candidate of Geological Mineralogical Sciences V.M. Kochetkov, heads of laboratories, Doctor of Geological Mineralogical Sciences V.S. Khromovskikh, chief scientific associate, Doctor of Geological Mineralogical Sciences A.A. Bukharov and Candidate of Geological Mineralogical Sciences V.I. Dzhurik, leading scientific associates, Candidate of Technical Sciences N.Ye. Zarubin, Candidate of Physical Mathematical Sciences L.A. Misharina, and Candidates of Geological Mineralogical Sciences R.A. Kurushin, V.K. Laperdin, V.V. Nikolayev, V.A. Pavlenov, and R.M. Semenov, senior scientific associates, workers of the same institute; Candidate of Geological Mineralogical Sciences B.P. Mishenkin, senior scientific associate of the Institute of Geology and Geophysics imeni 60-letiya Soyuza SSR of the Siberian Department of the USSR Academy of Sciences; Candidate of Geological Mineralogical Sciences B.M. Kozmin, head of a laboratory of the Yakutsk Affiliate of the Institute of Geology of the same department; Doctor of Geological Mineralogical Sciences M.M. Mandelbaum, chief geologist of the Irkutsk Production Geological Association for Geophysical Operations, Candidate of Geological Mineralogical Sciences B.M. Pismennyy, chief of a party of

the same association; Doctor of Geological Mineralogical Sciences Yu.K. Shchukin, head of a laboratory of the All-Union Scientific Research Institute of Geophysical Methods of Prospecting; Doctor of Geological Mineralogical Sciences S.M. Zamarayev; Candidate of Geological Mineralogical Sciences V.G. Yasko; geological engineer G.I. Rubanov—for the monograph "Geologiya i seismichnost zony BAM" [The Geology and Seismicity of the Zone of the Baykal-Amur Railway Line], which was published in eight volumes in 1983-1985, a prize in the amount of 20,000 rubles.

2. Candidate of Technical Sciences I.S. Afanasyev, director of the All-Union Scientific Research Institute of Prospecting Methods and Techniques, Candidate of Technical Sciences Yu.T. Morozov, head of a laboratory, S.A. Morozov and V.V. Pavlov, senior scientific associates, P.V. Stadnik, leading designer, workers of the same institute; Candidate of Technical Sciences Yu.S. Kostin, chief technologist of the Sosnovskoye Production Geological Association, V.R. Bruyev, senior engineer-technologist of an expedition of the same association; Yu.S. Razumov, deputy chief of a division of the Kirov Production Geological Association, V.B. Kazakevich, senior engineer-technologist of an expedition of the same association; Candidate of Technical Sciences Yu.G. Solovov, head of a division of the Transbaykal Complex Scientific Research Institute, Candidate of Technical Sciences V.V. Perminov, head of a sector of the same institute; Ye.M. Votinov, driller-instructor of the Northeastern Production Geological Association; V.M. Vtorykh, chief of a division of the Yeniseysk Production Geological Association for Petroleum and Gas Prospecting; Candidate of Technical Sciences V.P. Krasovskiy, chief engineer of a party of the Krasnoyarsk Production Geological Association; V.S. Shcherbachev, manager of a group of the Dnepropetrovsk Department of the Institute of Mineral Resources; Candidates of Technical Sciences F.D. Vytoptov and I.N. Strabykin, heads of laboratories of the Kazakh Scientific Research Institute of Mineral Raw Materials; Candidate of Technical Sciences V.I. Zhurnist, chief of an expedition of the Eastern Kazakhstan Production Geological Association imeni 60-letiya Oktyabrskoy revolyutsii, A.S. Penkov, former mechanic of a party of the same association; A.K. Nukushev, chief engineer of an expedition of the Central Kazakhstan Production Geological Association, M.P. Oleksenko, chief of a group of a party of the same association; Doctor of Technical Sciences S.S. Sulakshin, professor of Tomsk Polytechnical Institute imeni S.M. Kirov—for the development and introduction of methods, equipment, and technology of the drilling of directional and multiple hole wells in hard rocks, a prize in the amount of 20,000 rubles.

3. I.M. Lebedev, chief specialist of an administration of the USSR Ministry of Nonferrous Metallurgy; Doctor of Technical Sciences V.A. Bocharov, head of a laboratory of the State Scientific Research Institute of Nonferrous Metals, Candidates of Technical Sciences G.S. Agafova, V.M. Kopylov, and M.Ya. Ryskin, senior scientific associates, N.D. Pospelov, former deputy head of a

division, workers of the same institute; Candidates of Technical Sciences G.I. Arzhannikov and B.M. Koryukin, heads of laboratories of the Ural Scientific Research and Planning Institute of the Copper Industry, Candidate of Technical Sciences S.Yu. Semidalov, leading scientific associate of the same institute; R.I. Sulina, scientific associate of the All-Union Scientific Research and Planning Institute of the Mechanical Processing of Minerals; V.F. Pechin, director of the Gay Mining and Ore Dressing Combine imeni Leninskogo komsomola, B.L. Serebryannikov, chief of a dressing mill, A.V. Karbovskaya, chief of a laboratory, R.Kh. Reymer, chief of a section, G.I. Kireyeva, flotation plant worker, workers of the same combine; Candidate of Technical Sciences M.A. Belyayev, director of the Uchaly Mining and Ore Dressing Combine, Ye.P. Kalinin, chief of a dressing mill, F.G. Khamidullina, chief of a laboratory, V.T. Vlasenko, chief engineer of a mine, F.M. Imelbayeva, flotation plant worker, workers of the same combine; Z.L. Malikhov, chief engineer of the Bashkir Copper and Sulfur Combine, M.A. Zamesina, senior engineer of the same combine; I.I. Sidorov, chief of a dressing mill of the Sredneuralsk Copper Smelting Plant; V.I. Kotov, chief of a dressing mill of the Krasnouralsk Copper Smelting Combine imeni Sergo Ordzhonikidze; I.N. Lukash, chief project engineer of the Scientific Research and Planning Institute of the Dressing and Mechanical Processing of Minerals—for the development and introduction of advanced technological processes and equipment for the dressing of copper-zinc-pyrite ores of the Urals, a prize in the amount of 15,000 rubles.

4. Doctor of Medical Sciences Yu.A. Rakhmanin, manager of a laboratory of the Scientific Research Institute of General and Municipal Hygiene imeni A.N. Sysin of the USSR Academy of Medical Sciences, Candidate of Medical Sciences R.I. Mikhaylova, senior scientific associate, Candidate of Medical Sciences A.V. Filippova, junior scientific associate, workers of the same institute; V.N. Tychinin, deputy chief of the Medical and Sanitation Department of the USSR Ministry of Health, N.I. Bryuzgina, physician-laboratory assistant of the same department; Doctor of Technical Sciences A.I. Yegorov, manager of a laboratory of the All-Union Scientific Research Institute of Water Supply, Sewerage, Hydraulic Structures, and Engineering Hydrogeology, Candidate of Technical Sciences G.A. Ivleva, senior scientific associate, L.A. Guseva and G.S. Kolyadkina, senior engineers, workers of the same institute; V.F. Maslov, deputy chief engineer of the Orgstroyeniiproekt State Planning, Surveying, and Scientific Research Institute, I.N. Usanov, chief of a division, A.I. Sorozhkin, chief of a bureau, workers of the same institute; V.L. Malkov, chief engineer of the Mangyshlak Power Combine imeni 60-letiya SSSR, Candidates of Technical Sciences V.G. Kazeyev and D.S. Yurchenko, Yu.S. Baranov and V.Yu. Tarabin, chiefs of divisions, R.N. Musikhin, manager of a laboratory, Candidate of Technical Sciences A.P. Yegorov, senior scientific associate, workers of the same combine; Candidate of Technical Sciences I.G. Vakhnin, senior scientific associate of the Institute of Colloid

Chemistry and Hydrochemistry imeni A.V. Dumanskiy of the Ukrainian SSR Academy of Sciences—for the development and introduction of a technology and equipment for the production of artificial drinking water from sea water on the basis of industrial distilling desalinating plants, a prize in the amount of 11,000 rubles.

5. V.Ya. Kokotov and B.A. Sokolov, deputy technical directors of the Volga Association for the Production of Passenger Cars (AvtoVAZ); N.V. Lyachenkov, director of the body assembly works of the Volga Motor Vehicle Works imeni 50-letiya SSSR, Candidate of Technical Sciences E.I. Brekkel and A.N. Cherednichenko, deputy chief engineers, I.M. Kuchkurov, deputy chief of an administration, V.I. Baranov, I.Z. Beregovoy, Ya.O. Korf, E.A. Nechayev, and I.D. Shutov, chiefs of divisions, V.P. Sedov, deputy chief of a division, A.Ye. Dyumayev, A.G. Pirogov, and I.M. Trofimov, chiefs of bureaus, V.D. Skomorokhov and S.V. Shumilov, design engineers, V.Ya. Pushkarev, brigade leader, I.P. Koshelev, V.A. Chekmarev, and V.K. Chernikov, chiefs, A.A. Kulit, electrician, M.V. Lebedenko and N.V. Kasimov, mechanics, workers of the same works; Candidate of Technical Sciences E.M. Godin, docent of the Moscow Aviation Institute imeni Sergo Ordzhonikidze—for the development and introduction of a technology and automated adjustable welding complexes in the production of the bodies of motor vehicles of the VAZ family, a prize in the amount of 10,000 rubles.

6. Yu.B. Tzvetkov, chief metallurgist of an administration of a ministry; A.I. Yanovich, chief metallurgist of a machine building production association, V.B. Orekhov, deputy chief metallurgist, V.A. Meshkov, senior foreman, Ya.I. Sirotkin, engineer-technologist, V.S. Brozhek, smelter, workers of the same association; Doctor of Technical Sciences V.F. Solinov, chief of an institute, Candidate of Technical Sciences O.V. Shayev, chief of a department, Candidate of Chemical Sciences L.R. Batanova and R.I. Grichevskaya, senior scientific associates, Z.F. Nesterova, leading engineer, workers of the same institute; Ye.G. Kononova, deputy chief of a laboratory of an institute, Ye.V. Kononova, senior engineer of the same institute; V.S. Frolov, chief metallurgist of a machine building production association; V.V. Papikhin, chief of an administration of the USSR Ministry of Light Industry; Candidate of Technical Sciences I.M. Berdichevskiy, head of a laboratory of the All-Union Scientific Research Institute of the Porcelain and Earthenware Industry, O.N. Kochevanova, senior engineer of the same institute; M.B. Borisov, director of the Dulevskiy Porcelain Plant imeni gazety "Pravda", L.V. Dergachev, chief of a shop, T.A. Pashkova, chief of a laboratory, workers of the same plant—for the development and introduction in production of new technological processes of the melting of high-temperature alloys for especially critical items of aeronautical engineering, a prize in the amount of 15,000 rubles.

7. V.V. Nikipelov, chief designer of an administration of the USSR Ministry of the Shipbuilding Industry; V.M.

Potapov, chief project designer of a central design bureau, V.A. Stepanov and V.I. Troitskiy, chiefs of sectors of the same bureau; V.N. Bezzhonov, general director of the Astrakhan Shipbuilding Production Association imeni 60-letiya Soyuz SSR, O.V. Generalov, deputy chief technologist of the same association; A.N. Gorbachev, chief project builder of the Vyborg Shipbuilding Plant, G.I. Romanov, fitter-assembler of the same plant; V.I. Skolkov, chief of a section of a shop of the ERA Enterprise; N.P. Klyushnichenko, leading engineer of a machine building plant; Candidate of Technical Sciences I.N. Galakhov, chief of a sector of the Central Scientific Research Institute imeni Academician A.N. Krylov; D.V. Patarakin, senior scientific associate of an affiliate of the Central Scientific Research Institute; I.A. Dmitriyev, chief project designer of the planning and design bureau for the designing of equipment for the production of plastics and synthetic resins; N.G.-K. ogly Kurbanov, deputy director of the Azerbaijan Scientific Research and Planning Institute of Petroleum Machine Building; P.L. Feldblyum, chief project designer of the Moscow Neftegazavtomatika Scientific Production Association; A.A. ogly Abdullayev, general director of the Azerbaijan Neftegazavtomat Scientific Production Association; Candidate of Technical Sciences B.M. Parfenov, head of a division of the All-Union Scientific Research, Planning, and Design Institute for Automatic Electric Drive in Industry, Agriculture, and Transportation; I.V. Glushanok, chief of a sector of the Scientific Research Institute of the Leningrad Elektrosila Production Electrical Machine Building Association imeni S.M. Kirov; A.A. Noskov, chief of a division of an administration of the USSR Ministry of the Petroleum Industry; El-oglan Kurbanov, head of a laboratory of the State Scientific Research and Planning Institute for the Assimilation of Petroleum and Gas Deposits; O.K. ogly Selimkhanov, chief engineer of an administration of the Kaspiy Neftegazprom Production Association for the Drilling of Oil and Gas Wells; O.A. Gabov, head of a sector of the Scientific Research Institute of Heavy Machine Building of the Urals Mash Production Association, N.G. Sumenkov, leading designer of the same institute; Ye.I. Radinskiy, chief specialist of a division of a planning institute—for the development and assimilation of the series production of floating drilling rigs for the drilling on the continental shelf of exploratory wells 6,000 meters deep with a sea depth of up to 200 meters, a prize in the amount of 20,000 rubles.

8. A.Ye. Trubachev, chief specialist, Candidate of Technical Sciences V.N. Plisko, chief of a laboratory, Doctor of Technical Sciences N.V. Shiganov, senior scientific associate, Ye.V. Bulanyy, chief of a group, N.N. Zhuykova, engineer, workers of a scientific research institute; Candidate of Technical Sciences T.N. Osokina, leading engineer of a scientific production association; V.A. Shkandiykov, chief of a group of a design bureau; Candidate of Technical Sciences Yu.L. Yarovinskiy, chief welder of a machine building plant; O.M. Novikov, chief of a sector of a scientific research institute; O.A. Maslyukov, chief welder of a machine building plant; Candidate of Technical

Sciences V.I. Lukin, chief of a laboratory, Candidate of Technical Sciences R.S. Kurochko, senior scientific associate, V.M. Loskutov, leading engineer, workers of the All-Union Scientific Research Institute of Aviation Materials; Candidate of Technical Sciences A.G. Simonik, leading scientific associate of the Scientific Research Institute of Technology and Organization of Production; F.R. Kulikov, chief welder of a machine building plant; I.N. Melnikov, chief engineer of a scientific production association; A.M. Toshchev, chief welder of a machine building design bureau; Candidate of Technical Sciences B.A. Steblovskiy, head of a division, Doctor of Technical Sciences A.Ya. Ishchenko, head of a laboratory, workers of the Institute of Electric Welding imeni Ye.O. Paton; Candidate of Chemical Sciences S.F. Belov, prorektor, Candidate of Technical Sciences M.S. Igumnov, docent, Candidate of Technical Sciences T.I. Avayeva, senior scientific associate, workers of the Moscow Institute of Fine Chemical Technology imeni M.V. Lomonosov; Doctor of Technical Sciences M.A. Abralov, head of a chair of Tashkent Polytechnical Institute imeni A.R. Beruni; Doctor of Technical Sciences S.M. Gurevich—for the development and introduction in production of highly efficient methods and means of the welding of magnesium, aluminum, and titanium alloys, a prize in the amount of 12,000 rubles.

9. V.O. Sitov, chief of the Vitebsk Special Design Bureau of Gear Cutters, Grinders, and Tool and Cutter Grinding Machines, A.M. Zinder, chief designer, V.A. Nikolayev, deputy chief designer, N.Ye. Golubev, M.N. Konnikov, S.V. Kolesnikov, M.I. Kolonitskiy, and L.B. Makarevich, heads of divisions, Yu.A. Kaplan, N.Z. Peskin, and M.V. Tsuranov, chief project designers, V.A. Olekhovich and V.I. Chicherin, heads of sectors, workers of the same bureau; Ye.M. Selishchev, chief engineer of the Moscow Special Design and Technological Bureau of Metal-Cutting Tools and Equipment; L.P. Akulenok, director of the Vitebsk Plant of Tool and Cutter Grinding Machines imeni XX syezda KPSS, Yu.Ya. Dron, chief engineer, V.S. Kucherenko, chief designer, G.I. Ioffe, chief of a works, A.K. Ivanov, senior foreman, workers of the same plant; Candidate of Technical Sciences G.M. Fateyev, deputy head of a division of the Experimental Scientific Research Institute of Metal-Cutting Machine Tools; Ye.P. Rudenkov, deputy chief of a shop of the Minsk Plant of Special Tools and Machine Tool Attachments; Yu.P. Chugrin, deputy chief of a shop of the Motor Vehicle Works imeni Leninskogo komsomola (the Moskvich Production Association); Candidate of Technical Sciences V.A. Kashchuk, chief of a sector of the Scientific Research Institute of Technology and Organization of Production of Engines; G.B. Rudnitskiy, mechanical engineer—for the development and introduction in production of a highly efficient technology for the sharpening of metal-cutting tools and the grinding of items made of nonmetallic materials, a prize in the amount of 20,000 rubles.

10. V.V. Pavlov, chief of a specialized association for the transportation of large heavy cargoes, Candidate of Technical Sciences A.S. Diamidov, deputy chief of a bureau, S.A. Dobrinskiy, head of a sector, workers of the

same association; A.M. Levushkin, deputy chief of the Gorkiy Specialized Production Association for the Transportation of Large Heavy Cargoes, Yu.A. Akifyev and V.A. Larin, riggers of the same association; V.N. Androsyuk, deputy chief of an administration of the USSR Ministry of Railways, L.M. Moshek, chief of a department of the same ministry; Doctor of Technical Sciences A.Ya. Kogan, head of a laboratory of the All-Union Scientific Research Institute of Railway Transportation, Doctor of Technical Sciences A.A. Lvov, senior scientific associate of the same institute; Candidate of Technical Sciences P.S. Anisimov, docent of the Moscow Institute of Railway Transportation Engineers; Ye.D. Kiyko, chief of a transporter car of the Zaporozhye Department of the Dnepr Railroad; R.A. Atanasyan, head of a sector of the Southern Scientific Research, Planning, and Design Institute of the Maritime Fleet; A.Z. Shevchenko, chief of a division of the Black Sea Shipping Company, A.G. Nagornyy, second mate of a motorship of the same shipping company; O.F. Goryushin, deputy chief of a division, V.P. Kochenkov, mechanic, workers of an institute; V.P. Tokmakov, chief of the Central Planning and Design Bureau of the RSFSR Ministry of the River Fleet; N.A. Liunov, captain-second engineer of a motorship of the Northwestern River Shipping Company; Doctor of Technical Sciences A.A. Chebotayev, head of a division of the Institute of Complex Transportation Problems, Yu.S. Mostovoy and G.N. Shustova, senior scientific associates of the same institute—for the development and introduction in the national economy of a complex technology of the transportation of large heavy industrial and power equipment, a prize in the amount of 20,000 rubles.

11. M.D. Veselov, deputy director of the Scientific Research Institute of Electrophysical Apparatus imeni D.V. Yefremov, Doctor of Technical Sciences Yu.P. Vakhrushin, chief of a department, Ye.A. Podkamenev, chief of a works, G.I. Sorokin, chief of a shop, Candidates of Technical Sciences I.A. Prudnikov and A.A. Tunkin and Yu.A. Sokolov, chiefs of divisions, G.N. Topilskiy, chief engineer of a section, V.A. Kiselev, leading engineer, Yu.F. Chichikalov, senior scientific associate, Yu.V. Belov, A.V. Belousov, and Yu.M. Pereskokov, chiefs of groups, A.A. Budtov, chief of a brigade, A.S. Krestyaninov and V.P. Malyshev, chiefs of stands, workers of the same institute; Doctor of Technical Sciences A.P. Kozlov, manager of a laboratory of the Scientific Research Institute of Oncology imeni Professor N.N. Petrov, A.V. Regel, leading engineer of the same institute; Doctor of Medical Sciences L.P. Simbirtseva and Candidate of Technical Sciences I.A. Yermakov, managers of the Central Scientific Research Institute of Roentgenology and Radiology, R.V. Sinitsyn, manager of a laboratory, O.A. Shtukovskiy, manager of a department, workers of the same institute—for the development and introduction at leading clinics of the country of linear electron accelerators for beam therapy, a prize in the amount of 10,000 rubles.

12. Doctor of Technical Sciences N.A. Iofis, chief of a laboratory of a design bureau, A.S. Bukatov and A.S.

Kostretsov, leading engineers of the same bureau; Yu.G. Yegorov, director of a plant, N.G. Kalugina, polisher of the same plant; Corresponding Member of the USSR Academy of Sciences B.G. Gribov, director of a scientific research institute, Candidate of Chemical Sciences B.I. Kozyrkin, chief of a laboratory, Candidate of Technical Sciences A.V. Agafonov, chief of a sector, V.I. Kalugin, leading engineer, M.K. Bodrikov, instrument control man, workers of the same institute; V.F. Udaltsov, deputy chief of a special design bureau, Candidate of Technical Sciences S.V. Yevdokimov, chief of a laboratory, A.P. Melnikov, manager of a group, V.P. Mutnykh, mechanic, workers of the same bureau; Doctor of Medical Sciences N.B. Dobrova, manager of a laboratory of the Institute of Cardiovascular Surgery imeni A.N. Bakulev of the USSR Academy of Medical Sciences, Yu.V. Zaretskiy, senior engineer of the same institute; Doctor of Medical Sciences A.N. Kaydash, manager of a division of the Institute of Surgery imeni A.V. Vishnevskiy of the USSR Academy of Medical Sciences, Doctor of Medical Sciences S.G. Khurtsilave, senior scientific associate of the same institute; Doctor of Medical Sciences M.L. Semenovskiy, head of a department of the Scientific Research Institute of Transplantation and Artificial Organs—for the development, organization of the series production, and introduction in medical practice of artificial heart valves, a prize in the amount of 10,000 rubles.

13. Academician A.M. Prokhorov, director of the Institute of General Physics of the USSR Academy of Sciences, supervisor of the work, Candidate of Technical Sciences V.S. Bukreyev, deputy director, Candidate of Physical Mathematical Sciences B.B. Krynetskiy, head of a laboratory, Candidate of Physical Mathematical Sciences K.S. Gochelashvili, senior scientific associate, workers of the same institute; Candidate of Physical Mathematical Sciences R.A. Kink and Candidate of Technical Sciences V.T. Mikhkelsoo, heads of laboratories of the Institute of Physics of the Estonian SSR Academy of Sciences, Candidate of Physical Mathematical Sciences A.B. Treshchalov, leading scientific associate, Candidate of Physical Mathematical Sciences Ye.B. Berik, senior scientific associate, V.A. Tsubin, scientific associate, workers of the same institute; Candidate of Technical Sciences K.Yu. Saar, head of a division, A.A. Vill, head of a sector, workers of a special design bureau of the Estonian SSR Academy of Sciences, E.K. Erma, director, M.M. Raamets, head of a division, Candidate of Technical Sciences R.E. Raamat, T.P. Lepasaar, and E.A. Urbanik, chief project designers, workers of the Tartu Affiliate of the same bureau; Candidate of Technical Sciences Kh.Ya. Lind, chief engineer of the Special Design Bureau of Computer Technology of the Institute of Cybernetics of the Estonian SSR Academy of Sciences; Doctor of Physical Mathematical Sciences Yu.I. Bychkov, head of a division of the Institute of High Current Electronics of the Siberian Department of the USSR Academy of Sciences, Candidate of Physical Mathematical Sciences V.F. Tarasenko, senior scientific associate of the same institute; I.V. Moskalenko, chief of

a group of the Institute of Atomic Energy imeni I.V. Kurchatov, Doctor of Physical Mathematical Sciences V.M. Borisov, chief of a laboratory, Candidate of Physical Mathematical Sciences Yu.Yu. Stepanov, senior scientific associate, workers of an affiliate of the same institute; A.N. Gurov, director of a machine building plant; Candidate of Technical Sciences V.Ye. Mnuskin, chief of a laboratory of a scientific research institute—for the development and introduction in the national economy of vacuum-ultraviolet, ultraviolet, and visible excimer laser spectrometers, a prize in the amount of 10,000 rubles.

14. Candidates of Technical Sciences M.U. Polyak and Yu.A. Alekseyev, chiefs of divisions of the Central Scientific Research Institute of Communications, Candidate of Technical Sciences V.E. Chernyy, A.P. Bayev, Yu.A. Kravtsov, A.I. Milin, and E.R. Samitov, chiefs of laboratories, Candidate of Technical Sciences P.V. Melnikov, senior scientific associate, workers of the same institute; A.V. Tamashauskas, senior engineer of the Vilnius Operational and Technical Center of Communications; A.S. Semenov, deputy general director of a production association, G.A. Smolyayev, deputy chief of a division, A.P. Kondrashov, deputy chief engineer of a plant, A.V. Ignatyev, leading designer, workers of the same association; Candidate of Technical Sciences S.A. Peregonov, chief of a division of a scientific production association, Yu.A. Kalinychev, leading engineer, A.A. Kulakov, leading designer, workers of the same association; V.A. Matveyev, chief engineer of a plant, V.N. Bartsev, chief engineer of a bureau, N.S. Appak, chief designer, workers of the same plant; Candidate of Technical Sciences I.M. Kuznetsov, chief of a sector of the USSR State Agroindustrial Committee; A.A. Budilov, chief engineer, V.I. Balabanov, chief of a division, workers of a plant; Candidate of Technical Sciences V.M. Shteyn—for the development and introduction in the unified automated network of communications of the country of digital equipment of rural communications, a prize in the amount of 15,000 rubles.

15. Candidate of Technical Sciences P.V. Dmitriyev, chief of a department of a ministry; Candidate of Technical Sciences P.F. Kruglikov, chief of a division of an institute, M.L. Pogostin, chief of a shop of the same institute; A.P. Chervyakov, chief engineer of an instrument making production association, A.A. Ogorodnikov, design engineer, Ye.M. Shabrova, engineer, T.L. Zakurdayeva, fitter, workers of the same association; V.A. Molchanov, deputy chief of a division of an electrical equipment association, V.N. Polosukhin, chief of a bureau of the same association; Candidate of Technical Sciences I.Ye. Zablotskiy, chief of a department of an institute, Candidate of Technical Sciences L.V. Khalatova, chief of a division of an affiliate of the same institute; Yu.K. Zabolotskiy, chief of a division of a bureau of a scientific production association, D.I. Nikolayev, leading engineer of the same association; Candidate of Technical Sciences L.I. Vaynberg, senior scientific associate of the Moscow Aviation Institute imeni

Sergo Ordzhonikidze, Candidate of Technical Sciences V.A. Golubev, docent of the same institute; Candidate of Technical Sciences V.N. Ivanov, director of the All-Union Scientific Research Institute of Electrical Measuring Instruments, Candidate of Technical Sciences R.E. Kapiyev, chief of a division of the same institute; Doctor of Technical Sciences N.L. Prokhorov, director of the Institute of Electronic Control Machines, Candidate of Technical Sciences N.D. Kabanov, head of a division, Candidate of Technical Sciences A.N. Shkamarde, head of a department, workers of the same institute; Doctor of Technical Sciences L.S. Sitnikov, head of a laboratory of the Scientific Research Institute of Standardization in Instrument Making; Yu.I. Ushakov, former deputy chief engineer of the Kvant Production Association, A.T. Dmitrenko, deputy chief of a bureau of the same association—for the development and placement into operation of flexible automated sections of the monitoring of aviation equipment, instruments, and engines on the basis of standardized measuring and computing control complexes, a prize in the amount of 12,000 rubles.

16. Doctor of Economic Sciences V.P. Tikhomirov, general director of the Tsentrprogrammssystem Scientific Production Association, V.I. Sizov, chief engineer, Candidate of Technical Sciences I.G. Gordiyenko and A.F. Petrov, heads of laboratories, S.Ye. Chizhikov, scientific associate, workers of the same association; Candidate of Technical Sciences V.Ye. Gorskiy, deputy director of the Institute of Electronic Control Machines, N.M. Saukh, senior scientific associate of the same institute; Candidate of Technical Sciences I.Ya. Landau, Candidate of Physical Mathematical Sciences V.P. Semik, heads of divisions of the Institute of Problems of Information Science of the USSR Academy of Sciences, Candidate of Technical Sciences M.I. Belyakov, head of a sector, Candidate of Technical Sciences A.G. Ivanov, senior scientific associate, Yu.I. Rabover, scientific associate, workers of the same institute; D.V. Burkov, junior scientific associate of the Leningrad Institute of Information Science and Automation of the USSR Academy of Sciences; M.V. Paremskiy, chief of a group of the Institute of Atomic Energy imeni I.V. Kurchatov, A.P. Rudnev, junior scientific associate, V.V. Bardin and Yu.V. Shkolnikov, engineers, S.A. Usikov, graduate student, S.A. Anshukov, computer operator, workers of the same institute; L.A. Yegoshin, junior scientific associate of the Institute of High Energy Physics; Candidate of Technical Sciences V.V. Mitrofanov, chief of a division of the Persey Scientific Production Association, A.P. Shatave, leading designer of the same association; Candidate of Technical Sciences M.I. Davidov, head of a chair of the Institute of the Improvement of the Skills of Management Personnel and Specialists of the Automotive Industry, V.G. Antonov, head of a sector of the same institute; Doctor of Technical Sciences B.I. Rameyev, deputy chairman of a scientific and technical council of the USSR State Committee for Computer Technology and Information Science—for the development and introduction in practice of a family of standardized

operating systems for general-purpose computer complexes, a prize in the amount of 12,000 rubles.

17. S.Ye. Alferov, chief specialist of an administration of the USSR Ministry of Power and Electrification; Candidate of Technical Sciences Ye.I. Udod, chief of an administration of the Ukrainian SSR Ministry of Power and Electrification; O.I. Kulmatitskiy, deputy chief engineer of the Vinnitsa-energo Production Power Engineering Association, V.L. Taloverye, deputy chief engineer, A.P. Vodolchuk, electrician, workers of the pilot experimental enterprise for the performance of work on electric power transmission lines without deenergizing of the same association; A.N. Boldyrev, chief of a laboratory of the Donbassenergo Production Power Engineering Association, A.A. Lazurenko, foreman of the central enterprise of electric power networks of the same association; B.I. Malaniy, electrician of the Dnepropetrovsk Enterprise of Electric Power Networks; N.G. Bayborin, electrician of the Kherson Enterprise of Electric Power Networks; V.I. Andrushchenko, director of the Feodosiya Enterprise of Electric Power Networks; P.M. Kaguy, electrician of the Lvov Enterprise of Electric Power Networks; V.V. Kobzar, electrician of the Kiev Right Bank Enterprise of Electric Power Networks; I.M. Krivenko, foreman of the Cherkassy Left Bank Enterprise of Electric Power Networks; N.D. Spivak, senior engineer-inspector of a zonal organ of the State Inspectorate for the Operation of Electric Power Plants and Networks; V.N. Zhuravlev, foreman of a production association for the exploitation of long-range electric power transmissions; I.G. Barg, deputy chief of a shop of the Soyuztekhnenergo Production Association for the Adjustment, Improvement of the Technology, and Operation of Electric Power Plants and Networks, Candidate of Technical Sciences V.V. Smekalov and S.V. Polevoy, brigade engineers, workers of the same association; Yu.N. Yashin, head of a division of a special design and technological bureau for insulators and fittings; V.M. Popov, foreman of a laboratory of an enterprise of Kishinev electric power networks; Candidate of Technical Sciences V.M. Kutin, head of a chair of Vinnitsa Polytechnical Institute—for the development and introduction in the national economy of a highly efficient technology of repairs under voltage of 220-750 kilovolt overhead electric power transmission lines, a prize in the amount of 10,000 rubles.

18. A.G. Liskin, chief engineer of a metallurgical works of the Izhorskiy zavod Production Association, Candidate of Technical Sciences V.Ye. Klyucharev, deputy chief of a laboratory, Candidate of Technical Sciences M.F. Yegorov, deputy chief designer, Candidate of Technical Sciences Ye.F. Zorkin and V.A. Lyamin, chiefs of divisions, Candidate of Technical Sciences E.Yu. Kolpishon, chief of a sector, A.V. Kuznetsova, former chief of a group, Ye.K. Gorova and L.K. Pykhtar, engineer-technologists, S.N. Chernyavskiy, steel maker, A.V. Shirkov, pit worker, L.A. Bogdanov, blacksmith, workers of the same association; Yu.S. Muravko, chief of a division of the Leningradskiy metallicheskiy zavod Production Association of Turbine Manufacture, I.M. Lobkovskiy, deputy chief of a division, Candidate of Technical Sciences Ye.G. Malyshevskaya, deputy chief of a

laboratory, workers of the same association; Doctor of Technical Sciences S.A. Iodkovskiy, Candidate of Technical Sciences V.K. Novitskiy, heads of laboratories of a scientific production association for the technology of machine building, Candidate of Technical Sciences N.V. Tikhomirov, former head of a laboratory, V.I. Ryzhov-Nikonov, flaw detector operator, workers of the same association; Candidate of Technical Sciences V.A. Plekhanov, head of a laboratory of the Scientific Production Association for the Study and Designing of Power Equipment imeni I.I. Polzunov, Candidate of Technical Sciences P.D. Khinskiy, senior scientific associate of the same association; V.V. Sobolev, metallurgical engineer—for the assimilation of the production of integral disk rotors for turbines for 1,000-megawatt nuclear electric power plants, a prize in the amount of 15,000 rubles.

19. B.P. Safonov, chief of the All-Union Industrial Association for the Production of Ferroalloys, supervisor of the work; V.A. Kisilitsyn, director of the Stakhanov Plant of Ferroalloys imeni 60-letiya Velikogo Oktyabrya, V.I. Yerko, chief engineer, I.P. Voropayev, senior engineer of a laboratory, L.N. Liventsov, smelter, workers of the same plant; E.I. Shkrabov, chief mechanic of the Kuznetsk Plant of Ferroalloys; V.D. Belan, chief engineer of the Zaporozhye Plant of Ferroalloys, M.I. Frish, former chief mechanic, V.K. Kvach, smelter, workers of the same plant; A.A. Petrov, chief of a shop of the Chelyabinsk Electrometallurgical Combine, Yu.I. Verkhovnykh, assistant chief of a shop, G.A. Krasnov, senior smelter, Ya.Ya. Gaydash, mechanic, workers of the same combine; Candidate of Technical Sciences V.F. Shevchenko, deputy chief engineer of the State Scientific Research and Planning Institute of the Metallurgical Industry, Candidate of Technical Sciences O.F. Shestakovskiy, chief of a division of the same institute; Candidate of Technical Sciences I.I. Barashkin, deputy director of the Scientific Research Institute of Metallurgy, Candidate of Technical Sciences V.M. Menshenin, head of a laboratory of the same institute—for the modernization of operating shops of ferroalloy production for the increase of the efficiency of the smelting of silicon alloys, a prize in the amount of 15,000 rubles.

20. Doctor of Chemical Sciences N.M. Dyatlova, chief of a division of the All-Union Scientific Research Institute of Chemical Reagents and Ultrapure Chemical Substances, supervisor of the work, Candidate of Chemical Sciences N.V. Tsurulnikova, senior scientific associate, Candidate of Technical Sciences Yu.P. Reshetnikov, leading scientific associate, workers of the same institute; Candidate of Technical Sciences Ya.M. Shchelokov, director of the Ural Production and Technical Enterprise, K.A. Koshkina, A.V. Mashanov, and B.V. Sokolskiy, leading engineers of the same enterprise; A.Z. Khromtsova, chief of a section of the Verkh-Issetskiy Metallurgical Plant, A.S. Vakhonin, mechanic of the same plant; V.N. Frolov, chief power engineer of the Chelyabinsk Metallurgical Combine, V.P. Sharkov, chief of a shop of the same combine; Ye.N. Sinelshchikova,

former chief concentration specialist of an administration of the USSR Ministry of Nonferrous Metallurgy; M.S. Sladkov, chief of a shop of the Sredneuralsk Copper Smelting Plant; Candidates of Chemical Sciences B.N. Driker and A.S. Mikhalev, docents of the Ural Institute of Forestry Engineering imeni Leninskogo komsomola; Candidate of Technical Sciences V.A. Vakulenko, chief of a division of the Plastmassy Scientific Production Association, V.P. Kogut, junior scientific associate, A.V. Dudin, instrument control man, workers of the same association; V.T. Shachnev, chief of a works of a plant, V.V. Sokolov, chief of a shop of the same plant; Candidate of Chemical Sciences V.D. Nechepurnyy, senior scientific associate of a scientific research institute; V.V. Sokolov, chief project engineer of a planning institute—for the development and introduction of a technology for the prevention of salt deposits and the corrosion of metal in the water system of metallurgical enterprises, a prize in the amount of 20,000 rubles.

21. V.G. Gavrillov, head of a division of the State All-Union Planning and Scientific Research Institute of Nonmetallic Ore Materials, Candidate of Technical Sciences V.A. Kostylev, head of a division of the All-Union Scientific Research, Planning, Design, and Technological Institute of Electrothermal Equipment, supervisors of the work; Candidate of Technical Sciences V.O. Brzhezanskiy, deputy director, B.S. Gilmanshin, head of a sector, Candidate of Technical Sciences G.I. Bobrova, senior scientific associate, workers of the State All-Union Planning and Scientific Research Institute of Nonmetallic Ore Materials; Ye.P. Lipov, chief engineer of the Filinskiy Mica Factory; V.S. Starikov, chief of a shop of the Nizhneudinsk Mica Factory, O.G. Tolkahev, mechanic of a shop of the same factory; V.G. Mishin, chief of a shop of the Belgorod Mica Factory; Z.V. Antipova, winder of the Kireyevsk Mica Factory; Yu.M. Gerchuk, leading designer of the All-Union Scientific Research, Planning, Design, and Technological Institute of Electrothermal Equipment—for a set of operations on the development and the organization of the industrial production of new refractory materials based on mica and a wide range of items based on them, a prize in the amount of 6,000 rubles.

[Signed] Chairman of the USSR Council of Ministers N. Ryzhkov

Administrator of Affairs of the USSR Council of Ministers M. Smirnyukov

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Winners of 1988 Azerbaijan State Prizes in Science, Technology

18140265 Baku BAKINSKIY RABOCHIY in Russian
28 Apr 88 p 1

[Decree of the Azerbaijan CP Central Committee and the Azerbaijan SSR Council of Ministers "On the Awarding of the 1988 Azerbaijan SSR State Prizes in Science and Technology"]

[Text] The Azerbaijan CP Central Committee and the Azerbaijan SSR Council of Ministers, having considered the suggestions of the Committee for Azerbaijan SSR State Prizes in Science and Technology, resolve to award the 1988 Azerbaijan SSR State Prizes to:

1. Academician of the Azerbaijan SSR Academy of Sciences, Doctor of Historical Sciences Pyusta Aziz Agakyyzy Azizbekova—for a series of works devoted to the activity of the Baku Commune and its commissars.

2. Doctor of Physical Mathematical Sciences Azer Khanafiyev, Candidate of Physical Mathematical Sciences Amirulla Mamedali oghly Mamedov, Candidate of Physical Mathematical Sciences Sharif Mursal oghly Efendiyev, Doctor of Physical Mathematical Sciences Kerim Ragim oghly Allakhverdiyev, Doctor of Physical Mathematical Sciences Grigoriy Lvovich Belenkiy, Doctor of Physical Mathematical Sciences Rauf Adil oghly Suleymanov, Doctor of Physical Mathematical Sciences Bakhadir Guseyn oghly Tagiyev—for the series of works "The Spectroscopy of the Electron and Oscillatory States of Chalcogenide and Oxide Semiconductors. The Effect of Electrical and Deformation Fields," which were published during 1970-1986.

3. Candidate of Geological Mineralogical Sciences Akif Ismail oghly Aliyev, Candidate of Geological Mineralogical Sciences Ziya Ali oghly Buniatzade, Doctor of Geological Mineralogical Sciences Ferid Gasan oghly Dadashev, Academician of the Azerbaijan SSR Academy of Sciences Shafayat Farkhad oghly Mekhtiyev, Corresponding Member of the Azerbaijan SSR Academy of Sciences Subkhi Gashum oghly Salayev—for the work "A Map of Petroleum and Gas Deposits and Promising Structures of the Azerbaijan SSR."

4. Doctor of Medical Sciences Ismail Teymur oghly Abasov—for a series of works on the diagnosis, treatment, and prevention of diseases of digestive organs.

5. Friduk Seyfatdinovich Aga-zade, director of the Baku Affiliate of the All-Union Scientific Research, Planning, and Design Institute of the Technology of Electrical Machine Building, Albert Mikhaylovich Akopov, head of a division of the Baku Affiliate of the All-Union Scientific Research, Planning, and Design Institute of the Technology of Electrical Machine Building, Nazim Samed oghly Muradov, head of a division of the Baku Affiliate of the All-Union Scientific Research, Planning, and Design Institute of the Technology of Electrical Machine Building, Ali Yusuf oghly Karakhanov, former general director of the Azerelektromash Production Association, Elman Ibniyamin oghly Aliverdiyev, former chief engineer of the Azerelektromash Production Association, Fazil Nadzhaf oghly Ismaylov, former deputy chief engineer of the Azerelektromash Production Association, Ziraddin Vagid oghly Kadimaliyev, former deputy chief of a shop of the Baku Electrical Machine

Building Plant imeni 50-letiya komsomola of the Azerelektromash Production Association,, Nazim Nadir ogy Guseynov, adjuster of a stamping shop of the Baku Electrical Machine Building Plant imeni 50-letiya komsomola of the Azerelektromash Production Association—for the development and introduction of a new metal-saving technology and equipment for the production of sheets of magnetic circuits of electric motors.

[Signed] Secretary of the Azerbaijan CP Central Committee K. Bagirov

Chairman of the Azerbaijan SSR Council of Ministers G. Seidov

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Winners of 1988 Georgian State Prizes in Science, Technology

18140257 Tbilisi ZARYA VOSTOKA in Russian
25 Feb 88 pp 1, 3

[Article under the rubric "In the Georgian CP Central Committee and the Georgian SSR Council of Ministers": "On the Awarding of the 1988 Georgian SSR State Prizes in Science and Technology"]

[Text] The Georgian CP Central Committee and the Georgian SSR Council of Ministers, having considered the representation of the Committee for Georgian SSR State Prizes in Science and Technology attached to the Georgian SSR Council of Ministers, resolve:

To award the 1988 Georgian SSR State Prizes to:

In Science:

1. Academician of the Georgian SSR Academy of Sciences Irakliy Vissarionovich Abashidze (supervisor), editor in chief of the Georgian Soviet Encyclopedia;

—Levan Sergeyevich Bolkadze (posthumously);

—Shota Ippolitovich Vadachkoriya, honored worker of culture of the Georgian SSR, head of an editorial board of the same encyclopedia;

—Iogan Levanovich Vardosanidze, honored worker of culture of the Georgian SSR, responsible secretary of the Main Editorial Board of the same encyclopedia;

—Irakliy Akakiyevich Kipiani, honored journalist of the Georgian SSR, head of an editorial board of the same encyclopedia;

—Doctor of Historical Sciences Professor Roin Viktorovich Metreveli, rector of Tbilisi State Pedagogical Institute imeni A.S. Pushkin, former deputy editor in chief of the Main Editorial Board of the same encyclopedia;

—Tsiala Aleksandrovna Tsertsvadze, journalist, head of an editorial board of the same encyclopedia;

—Zurab Aleksandrovich Chelidze, physicist, head of an editorial board of the same encyclopedia—for the publication of the Georgian Soviet Encyclopedia in 12 volumes, which was published during 1975-1987.

2. Mikhail Yasonovich Chikovani (supervisor)—posthumously;

—Candidate of Philological Sciences Dzhondo Karlovich Bardavelidze, senior scientific associate, head of the Folklore Division of the Institute of Georgian Literature imeni Shota Rustaveli of the Georgian SSR Academy of Sciences;

—Doctor of Philological Sciences David Levanovich Gogochuri, senior scientific association of the Folklore Division of the same institute;

—Yelena Bagratovna Virsaladze (posthumously);

—Candidate of Philological Sciences Pikriya Zurabovna Zandukeli, senior scientific associate of the Folklore Division of the same institute;

—Varlam Sergeyevich Matsaberidze (posthumously);

—Kseniya Alekseyevna Sikharulidze (posthumously)—for the publication of the collection "Georgian Folk Poetry" in 12 volumes, which was published by the Metsniyereba Publishing House during 1972-1984.

In Technology:

1. Revaz Antonovich Asatiani, construction engineer, chief of the Tbilisi Repair and Construction Administration of the Georgian Republic Council for the Management of Health Resorts of Trade Unions;

—Guram Sabayevich Dzhimshelashvili, construction engineer, scientific associate of the laboratory of the physical chemical mechanics of concrete of the Institute of Construction Mechanics and Seismic Stability imeni K.S. Zavriyev of the Georgian SSR Academy of Sciences;

—Candidate of Technical Sciences Shota Abesalomovich Lomidze, construction engineer, honored engineer of the Georgian SSR, Georgian SSR deputy minister of construction;

—Candidate of Technical Sciences Ramaz Nikolayevich Machavariani, construction engineer, scientific associate of the laboratory of the physical chemical mechanics of concrete of the Institute of Construction Mechanics and Seismic Stability imeni K.S. Zavriyev of the Georgian SSR Academy of Sciences;

- Candidate of Technical Sciences Tengiz Ionovich Tatishvili, construction engineer, senior adviser of the Department of Rural and Water Management Construction of the Administration of Affairs of the Georgian SSR Council of Ministers;
 - Doctor of Technical Sciences Professor Zurab Nikolaevich Tsilosani, engineer, honored figure of science of the Georgian SSR, head of the Division of the Mechanics of Concrete and Reinforced Concrete of the Institute of Construction Mechanics and Seismic Stability imeni K.S. Zavriyev of the Georgian SSR Academy of Sciences;
 - Tengiz Valeryanovich Chikvaidze, construction engineer, honored engineer of the Georgian SSR, first deputy chairman of the republic Gruzagrostroy Association of the Georgian SSR State Agroindustrial Committee—for the work "The Development and Introduction at Objects of the Agroindustrial Complex of the Georgian SSR of Items Made of Wood Impregnated With Sulfur," which was carried out during 1978-1987.
 - 2. Amiran Ivanovich Bakuradze, metallurgist, leading engineer of the laboratory of casting processes of the Institute of Metallurgy imeni 50-letiya SSSR of the Georgian SSR Academy of Sciences;
 - Candidate of Technical Sciences Anzor Gerasimovich Gabisiani, metallurgist, senior scientific associate, manager of the laboratory of the out of furnace processing and casting of steel of the same institute;
 - Candidate of Technical Sciences Guram Venediktovich Kashakashvili, metallurgist, honored engineer of the Georgian SSR, director of the Rustavi Metallurgical Plant of the USSR Ministry of Ferrous Metallurgy;
 - Candidate of Technical Sciences Manuchar Davidovich Lanchava, metallurgist, senior scientific associate, manager of the laboratory of casting processes of the Institute of Metallurgy imeni 50-letiya SSSR of the Georgian SSR Academy of Sciences;
 - Candidate of Technical Sciences Vakhtang Varlamovich Mosiashvili, metallurgist, chief engineer of the Rustavi Metallurgical Plant of the USSR Ministry of Ferrous Metallurgy;
 - Merab Vakhtangovich Mumladze, metallurgist, chief of an open hearth shop of the same plant;
 - Tamaz Aleksandrovich Shatirishvili, metallurgist, deputy chief engineer of the same plant—for the work "The Development and Extensive Industrial Introduction of a New Highly Efficient Technology of the Treatment of Molten Steel With Inert Gases," which was carried out during 1983-1987.
- For Textbooks for Higher and Secondary Specialized Educational Institutions**
- Nikolay Artemyevich Tevzadze (posthumously)—for the textbook "Engineering Geodesy" in 10 volumes, which was published by the Ganatleba and Tbilisskiy gosudarstvennyy universitet Publishing Houses during 1974-1985.
- [Signed] Secretary of the Georgian CP Central Committee D. Patiashvili
- Chairman of the Georgian SSR Council of Ministers O. Cherkeziya
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Marchuk on Restructuring, Democratization in Science

18140254 Moscow SOTSIALISTICHESKAYA
INDUSTRIYA in Russian 17 Apr 88 p 1

[Interview with President of the USSR Academy of Sciences Academician Guriy Ivanovich Marchuk by D. Pipko: "Science and Democracy. Academician G. Marchuk, President of the USSR Academy of Sciences, Answers the Questions of SOTSIALISTICHESKAYA INDUSTRIYA"; date and place not given; first paragraph is SOTSIALISTICHESKAYA INDUSTRIYA introduction]

[Text] The Day of Soviet Science, which is being celebrated today, is by right called the holiday of trailblazers. Lenin's famous prediction is coming true before our eyes—science is becoming an immediate productive force of society. Its discoveries and achievements are the basis for new generations of equipment, advanced technologies and materials, and entire new sectors of industry. We can no longer tolerate the fact that in a number of directions our science has not succeeded in attaining and consolidating the most advanced positions. In order also to accomplish this task, not only organizational restructuring or additional investments, but also the further intensification of democracy in science itself are needed.

G. I. Marchuk: Today there is no longer a need to convince one of the necessity of the leading development of basic research. Everyone understands: if the Academy of Sciences loses speed in the storming of new heights, the national economy will feel this already in 5-7 years, when 'there is a shortage' of new machines, technologies, and materials. No efforts of sectorial scientific research institutes, designers, and planners will save the situation, if basic science does not provide them with new ideas.

Take, for example, the phenomenon of high-temperature superconductivity, which was discovered a year ago—it quickly developed from a scientific achievement into an object of increased attention on the part of many governments. Why? For we learned long ago to obtain superconductivity at the temperatures of liquid helium. It turns out that the shift from them to the higher temperatures of liquid nitrogen promises a genuine revolution in many fields of technology. Hence the aspiration to organize the work in order to win the competition.

Promising ideas have also become today a kind of pass to participation in important national and international programs and projects. Eureka, Technopolis, Human Potentials, Fifth-Generation Computers, the Comprehensive Program of Scientific and Technical Progress of the CEMA Member Countries—all of them are aimed at a breakthrough to qualitatively new levels of science, technology, and production. Finally, we are obliged to recall that basic research influences not only the economy and the well-being of people, but also their world outlook.

As is known, the scientific forecast of the consequences of a nuclear war, which was made by scientists, played a considerable role in the uniting of peace-loving forces and in the formation of new thinking. Something similar is also occurring today in the area of ecology. Now, for example, a program of biospheric and ecological research, which encompasses a wide range of basic problems, is being formulated at the USSR Academy of Sciences. A number of them will also find reflection in the major Global Changes International Program, which it is planned to approve in September at the session of the International Council of Scientific Unions in Beijing.

Of course, the boldest, most promising idea in itself does not guarantee success—it is still necessary to implement it. And to implement it quickly. For us this is one of the most painful problems. D. Pipko:

But you yourself, as far as I

know, before Novosibirsk worked in Obninsk, where you dealt with designs of atomic reactors, including for the first nuclear electric power plant in the world. As a participant in the atomic program can you say what helped to accomplish it in the shortest possible time? And why is it impossible to carry this experience over to our days?

G. I. Marchuk: Perhaps, for me the contrast was especially great because before Obninsk in Moscow I dealt with atmospheric dynamics. The work on the atomic problem was distinguished not only by the most intense rhythm—in it in practice there were not notorious meeting points between science and production. The results of the calculations were checked right away in experiments, the designers immediately designed some devices or others, while the plants produced them without delays. A management organ attached to the USSR Council of Ministers supervised all the work.

Is it possible to repeat this experience? I believe that it is. There are also problems which require attention at the government level. I would group with them the set of questions connected with the development of computer technology and with biotechnology. On the other hand, we are placing great hopes in the new economic mechanism, in the Law on the State Enterprise, and on the changeover of science to cost accounting. If enterprises, as is contemplated, acquire independence in questions of production, ministries will be left with no other way out than to become sectorial headquarters of scientific and technical progress. In this role their interest in basic science will increase. And so will the aspiration to use its results more rapidly. True, for the present these are only hopes. D. Pipko:

Guriy Ivanovich, you headed the Siberian Department of the Academy of Sciences precisely during the years when the establishment of the belt of introduction made up of sectorial scientific research institutes and design bureaus was completed around the Academy Campus. They say that many of the hopes placed in it were not justified. What is the matter?

G. I. Marchuk: In my opinion, both the idea and the hopes justified themselves. Although the practical return, of course, could have been greater. In advancing

this idea, Academician M.A. Lavrentyev, founder and first chairman of the Siberian Department, strove to clear for basic science the way into practice. For this he proposed to establish around the Academy Campus 15 scientific research institutes and design bureaus with pilot works, which would take the baton from academic institutes.

Owing to the belt of introduction the national economy was provided with many advanced technologies and fundamentally new technical solutions. The trouble is that the partners did not have joint supervision. While the ministries, in worrying about the development of the directions, for which they were responsible, repeatedly prevented the implementation of intersectorial ideas. Several scientific research institutes and design bureaus ceased to cooperate with the academy. But the contacts of people were not severed. They continued to meet at conferences and seminars, where sectorial science, just as before, received a store of new ideas.

It is different to overestimate this role of the Academy Campus. The time came also to think about how to put more efficiently to use the potential of the belt of introduction as well. One of the suggestions being voiced in this connection is to create from academic and sectorial organizations a State Scientific Production Association with a unified program of work and a common organ of management.

D. Pipko: Why does every step along the path of the integration of science and production come with such difficulty to us? You took part in the establishment of MNTK's—interbranch scientific technical complexes. Two years have passed, but thus far they do not have a reliable mechanism of operation. Is it perhaps necessary simply to return to the initial idea of special-purpose financing through the head organization? Only now to issue it a state order.

G. I. Marchuk: Special-purpose financing, undoubtedly, is one of the key elements in the idea of interbranch scientific technical complexes. But for the present its concept has stumbled against the possessive instincts of ministries. Attempts to settle the question have been made in the draft of the new statute on the complexes. In it, in particular, it is proposed to make the interbranch scientific technical complex a legal entity with all the ensuring powers. And to make the collectives or subdivisions, which are a part of the complex, regardless of their departmental affiliation, a component of it with the rights, say, of scientific engineering centers.

D. Pipko: You are placing great hopes in cost accounting principles. But does not the threat that in pursuit of the ruble the managers of academic scientific research institutes will ground science, frighten you? And as a result we will be without breakthrough ideas....

G. I. Marchuk: It does not frighten me. First of all because no one except the state will finance 75 percent of our research. For example, the first direct observation in history of the explosion of a supernova in the Great Magellan Cloud was one of the most important events of the past year. Which of the ministries will agree to provide money for such work?

But several of our institutes would be quite capable of increasing the amount of cost accounting themes, say, from 15 to 25 percent. Of course, not by means of minor themes. We believe that important problems of intersectorial importance should be financed in the form of state orders through the USSR State Committee for Science and Technology. Thereby a constant scientific reserve would also be guaranteed. On the other hand, we hope that the ministries, having become headquarters of scientific and technical progress, will begin to order basic research from us. The leading sectors also did this in the past. While the demands on the quality and level of products will also force others to follow their example.

D. Pipko: It remains to be ascertained: Is the academy itself ready for such interaction with practice? For you yourself noted that it lacks dynamism in responding to new problems, the mobility of the organizational structures is low, the mechanism of management is not flexible enough.

G. I. Marchuk: Well, it is already possible today to say that the academy have changed over to a new mechanism of operation, in which the democratic principles have been strengthened. First of all the presidium has transferred a significant portion of the supervisory functions to the departments of the academy. This is enabling them to bear full responsibility for their own scientific directions and to settle many current questions more rapidly. In December an election, as a result of which the academy received such a powerful reinforcement, was held: 83 leading scientists of the country were elected full members (academicians) and 172 were elected corresponding members. In this election we availed ourselves for the first time of the opportunity to select for each scientist, who has reached the age of 75, a kind of understudy—with the same rights. On the eve of the election nearly 100 of the 250 academicians had already exceed this level. The new reinforcement on the average is 10 years younger than the former contingent.

Starting next year the procedure of financing is also being changed: assets and resources will now be allocated not for the maintenance of institutes, but for the solution of specific problems. Moreover, this will be done on the basis of a competitive selection, which actually is already under way. The essence of the procedure is that individual scientists, groups, or laboratories would receive the opportunity to propose plans and programs of research, which are considered by expert commissions. Those, whose proposals are recognized as most promising, receive budget financing. While the others are forced to seek clients.

Such a system of financing makes individual groups and laboratories less dependent on the dictation of the management of the institute. And it could not be otherwise: in order to achieve success, they should have the freedom to maneuver. On the other hand, the responsibility of such collectives increases: if they cannot accomplish a task, they will bring their reputation into question.

All these innovations originated from our certainty that without democracy science simply cannot develop. For every step in it is often a rejection of what was done yesterday by your colleagues, friends, tutors, and managers. It is easy to understand that any research work can turn into a growing conflict, if an atmosphere of mutual respect, benevolence, the free exchange of opinions, and a common interest in the end result is not created in the collective.

D. Pipko: You will agree, Guriy Ivanovich, that the main role in creating such an atmosphere belongs to managers. First of all the director of the institute. Why is the presidium of the academy stubbornly resisting the introduction of the appointment of directors by election?

G. I. Marchuk: We elected directors at the time when in the national economy they simply appointed people to practically all command posts. It is another matter that elections were conducted at the assemblies of departments, where only members of the academy had the right to vote. But such a practice makes considerable sense.

In academic science the director of a scientific research institute is truly a key figure. But not in the role of an administrator. In our opinion, he should first of all be a generator of ideas and a prominent scientist, who is capable of heading an entire scientific direction. Now they often hold up foreign experience as an example for us. But there, too, they usually give research money for a name, for a talented person, who is capable of foreseeing the paths of development for years and decades ahead.

Tell me, are rank and file associates, engineers, and laboratory assistants capable of evaluating such predictions? I believe that they are not. Therefore, we also entrusted the right to elect the director of an institute to those who have approximately the same level of scientific training, working in this or a related field. These are the members of the department. But they are suggesting to us a general arrangement, in which the final word in the election of a manager would belong to the entire collective of the institute.

D. Pipko: What kind of democracy is there without this? Even after this election less than 1,000 scientists bear the title of academician and corresponding member. And this handful of people determines the life of the academy, where there are 50,000 scientific associates alone. Do you have the right to ignore their opinion?

G. I. Marchuk: But do ministries really not manage enormous sectors, in which there are millions of workers? But in the main thing I completely agree with you: in those matters, which directly affect the interests of people, we are obliged to listen to their opinion. The new election procedure was also formulated with allowance made for this requirement.

In conformity with it, the collectives themselves of scientific research institutes, departments, and members of the academy can nominate candidates for the position of director. Each of the candidates should deliver his concept to the collective of the institute, after which a secret vote is conducted. Those of them, who have collected the largest number of votes, receive the right to present their program at an assembly of the department, to which representatives of the labor collective are also invited. Here the matter is finally settled. Moreover, by secret ballot. Therefore, it is entirely possible that not the candidate, who at the scientific research institute collected the largest number of votes, will be elected the director for the next 5 years.

Over a little more than the last 3 months elections at 114 institutes have already been held in accordance with this system. At only six the opinions of the collective and the department differed.

The election of a new director will entail an entire series of changes. Their point is, on the one hand, to create all the conditions that are necessary for the implementation of the proposed program. And, on the other, to democratize the process of forming the scientific councils of institutes. Now their members will not be appointed, but will be elected by secret ballot at the general assembly of all the scientific associates. Therefore, quite young scientists are also entirely capable of becoming members of the council. While the councils themselves will become less dependent on the will of the director.

Its next step is the development of a new structure of the institute, which conforms to the adopted research program. The scientific council should approve this structure, after which the process of selecting the managers of departments, sectors, and laboratories begins.

In the subdivisions, which also existed previously, where people know each other well, the election of candidates to the position of manager is set. All the personnel without exception take part in it. Then the candidates report their concepts and plans in the scientific council, which settles by secret ballot the question of the election of one of them. When it is a matter of new subdivisions of an institute, for them only the concluding part of this procedure is carried out: an open competition of plans, on the basis of which the question of the manager is settled by secret ballot, is held in the scientific council.

Thus, given the new system all the personnel of the academy will participate to one extent or another in the election of the management unit.

D. Pipko: Guriy Ivanovich, are you yourself quite frankly convinced that the new system will satisfy all the personnel of the academy? Or, if worst comes to worst, will the heat of passions over this question decrease?

G. I. Marchuk: Not entirely. But I know that we have all the same taken one fundamentally important step. Just recently it was believed that the managers of institutes, departments, and laboratories have the right to hold their positions all but to the end of their life. And how is it to be otherwise! For precisely they established these laboratories and scientific schools and supplied them with bold ideas. It was considered simply improper to aspire to their positions. Although everyone understood that science cannot forge ahead on old ideas. The new system not only makes the process of replacing management personnel the norm: not past services, but bold ideas and promising plans are becoming the criterion of choice. Hence, there will be great discoveries. There will be the results, for the sake of which we are all taking today lessons in democracy....

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Scientific Achievements, Restructuring of Science *18140259 Moscow PRAVDA in Russian 17 Apr 88 p 3*

[Article by V. Reut under the rubric "The Sunday Teletype": "There Will Be New Discoveries. Today Is the Day of Soviet Science"; first paragraph is PRAVDA introduction; photos not reproduced]

[Text] It is possible to say many good words about the achievements of Soviet science. The basic research of physicists, mathematicians, chemists, and biologists are paving the ways to the development of new materials and technological processes.

Last year, for example, the phenomenon of superconductivity at relatively high temperatures, which increases significantly the efficiency of its practical use, was discovered. It has already been possible to obtain superconducting thin films and high-quality crystalline superconductors. Chemists have developed polymer materials that have ferromagnetic properties, which is opening up for these new substances a broad sphere of practical application, including when developing the latest equipment. Impressive gains have been made in biochemistry, biotechnology, genetic engineering, and other fields of science.

Science in the outlying areas of the country is maturing more and more. The Siberian Department of the USSR Academy of Sciences during the decades of its existence has shown how fruitful its influence is on the economic and social development of the vast region. Another two similar academic complexes—the Ural and Far Eastern departments of the USSR Academy of Sciences—have been established. Of course, they emerged not in a void, but on the basis of the scientific centers that existed here,

but with broader rights, personnel and other possibilities, and prospects of further development. They are growing and becoming stronger. At the Ural Department, for example, there are now already 38 scientific institutions. Their material base is being improved, design bureaus and engineering centers are being set up. The Ural Program, which is intended for the period to 2000 and envisages the active participation of scientific institutions in the economic and social development of the region, is being prepared.

Institutions of sectorial and VUZ science are conducting much basic research. Thus, scientific discoveries, on the basis of which effective inventions have already been devised, were made by scientists of the Ufa Aviation Institute, the Moscow Scientific Research Institute of Vaccines and Sera imeni I. I. Mechnikov, the Leningrad All-Union Scientific Research and Planning Institute of the Mechanical Processing of Minerals, and others. New discoveries are also "on the approach" at a number of organizations.

The development of science is impossible without discussions, debates, and the comparison of different points of view: the truth appears during the democratic comparison of opinions. But it happens that such a struggle concludes rather quickly with the most simple administrative pressure: "Do as I say."

To learn democracy is the task not only of the manager, who is obliged to listen to the practical opinions and arguments of subordinates, but to not less a degree also of staff members—to eliminate in oneself the willingness to go against one's convictions in the name of protecting oneself from the displeasure of the chief. One cannot avoid otherwise the moral losses, which at times cannot be made up in any way and which will be visible in the decrease of the effectiveness of the work of the collective.

Scientific research organizations are now changing over to cost accounting. Unfortunately, this process is not going smoothly everywhere. At some scientific research institutes, as the editorial mail attests, nearly everything remains unchanged: the plans are literally crammed with various state orders. At others, on the contrary, the assignments in accordance with state orders are minimal, in other respects the institutes have been left to their own devices. For both cost accounting at first gives troubles. Some are forced to change the direction of a number of their subdivisions, others are forced either to seek any kind of work, including not at all characteristic work and various trifles, or to get rid of a portion of the staff members. All this is especially being felt at the sectorial scientific research institutes, where ministries and departments were not able to orient their scientific subdivisions in good time and properly toward work under the conditions of cost accounting. It is important to eliminate these hitches more rapidly.

Finally, as before the inveterate "Achilles' heel" is making itself felt—everything is still not well with the introduction of the achievements of science and technology and the results of advanced development. So far the changeover of enterprises to cost accounting, self-financing, and self-support [samookupayemost] is not particularly inducing economic managers to seek new equipment and technology. The USSR Union of Scientific and Engineering Societies promised to display its fighting character on this front as well. It would be a good thing.... Such good deeds will benefit the national economy and, in the end, all of us.

Photo Captions

The international collective of the Joint Institute for Nuclear Research in Dubna is working on the front line of modern nuclear physics.

[Top] Academician G. Flerov, manager of a laboratory, among staff members.

[Bottom] The U-400 accelerator, which was developed in the laboratory of nuclear reactions of the institute, where the road to the synthesis of transuranic elements is being paved.

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Glavlit Eases Secrecy Requirements for S&T Publications

18140501 Moscow NTR: PROBLEMY I RESHENIYA
in Russian 19 Jul-1 Aug 88 p 1

[Announcement: "Rolling Back Secrecy"]

[Text] Several generations of Soviet citizens have lived in an oppressive atmosphere of secrecy. This atmosphere is now being gradually dispelled, and the system's holy of holies has come under attack: the government classification system.

According to information from the Main Administration for the Safeguarding of Military and State Secrets in the Press, the procedures for approving scientific-technical articles for publication in the open press will soon be radically simplified. Unlike the present unwieldy review form which has to be approved at several points along the way, the new form will consist of just one page and will require only one signature for approval. A manager at the laboratory director level will have authority to conduct the review. The governmental and departmental lists of data that are not for open publication will be reviewed.

In upcoming issues of this publication, the editors plan to publish materials on the history of secrecy, the economic aspects of this phenomenon, and the problems of transferring classified technologies to the civilian sector.

Problems in Work of Efficiency Experts, Inventors

18140260 Moscow SOVETSKAYA ROSSIYA in
Russian 13 Apr 88 p 2

[Article by G. Rozhkov, mechanic of the Termopribor Production Association, Hero of Socialist Labor, member of the Presidium of the Central Council of the All-Union Society of Inventors and Efficiency Experts, under the rubric "Reflections of a Worker Prior to the 7th Congress of the All-Union Society of Inventors and Efficiency Experts" (Klin, Moscow Oblast): "Cooperatives for Innovators"; first paragraph is SOVETSKAYA ROSSIYA introduction]

[Text] The 7th Congress of the All-Union Society of Inventors and Efficiency Experts opens tomorrow. Today the All-Union Society of Inventors and Efficiency Experts unites in its ranks 14.5 million innovators. Their creative contribution to the national economy of the country is great. Last year the saving from the use of technical innovations exceeded 8.4 billion rubles. Owing to the introduction of their developments innovators saved the country over 1 million tons of rolled ferrous metal products and more than 10 billion kilowatt-hours of electric power and freed over 200,000 people from difficult manual and unskilled labor. In short, much has been done. However, in recent years many problems, which require immediate solution, have accumulated in the movement of innovators. On the eve of the opening of the regular congress of the All-Union Society of Inventors and Efficiency Experts well-known worker-innovator G. Rozhkov reflects on several negative trends in the work of efficiency experts and inventors.

Our enterprise, the Klin Termopribor Plant, is operating under the conditions of self-financing and cost accounting for the 2d year. And today it is possible to conclude: technical innovations have begun to be introduced in a worse manner. The whole point is that the reward to efficiency experts is paid from the material stimulation fund. And the assets for paying bonuses to the other workers of the plan are drawn from the same source. If one is to give the efficiency experts of the plan an incentive, the bonuses of others will seem appreciably more modest. Therefore, the situation with innovation in the past year did not improve, but worsened.

Distortions in management and legislative blunders today are also enabling a significant number of people to work without caring, but to live in clover. By way of proof I will cite an example that at first glance is far from our conversation. Have you pondered how an enterprise, which has changed over to cost accounting, can painlessly assign, just as before, tens or else hundred of workers to agricultural work? Our plant assigns at times up to 300 people at day during the hot months of the harvest. And is coping with the plan. How is that happening? For now it has become too costly to keep extra people. The explanation is quite simple. The whole secret is that the economic impact from efficiency promotion is not taken completely into account.

Last year at our plant they introduced in production 205 efficient proposals. However, they calculated the real economic impact only for 149 of them. Incidentally, it came to more than 287,000 rubles. As you see, the sum is a substantial one. But what happened with the remaining proposals? Among them there are such ones which change the technology fundamentally. Specialists cite the fact that it is impossible to calculate the saving due to the fact that there are no analogs, there is nothing with which to make a comparison. It turns out that the most advanced technical innovations due to the imperfection of methods find themselves in the role of stepsons. Their authors receive obviously smaller rewards than their colleagues, who developed something that only improves slightly something already known. Hence there is also emerging a powerful concealed reserve for plugging up the holes in the economy. Here it is being pretended that the principles of cost accounting are in effect. But it is sham cost accounting!

Everyone knows about these reserves. With allowance made for them rayon or city managers send an "allotment" for what is called "patronage" work. Although it is clear to every manager: in case of an intense plan and in case of the use of all the reserves of production it is impossible to pull tens of workers to the side! But this is also clear to labor collectives.

That is why innovators and the councils of the All-Union Society of Inventors and Efficiency Experts are striving for an exact calculation of the saving, which of obtained by the use of innovations that were developed by inventors and efficiency experts. The reason for the no less stubborn reluctance of the economic and planning services of enterprises to divide the saving into an innovation fund and a remainder, which was obtained by means of all other measures, is also understandable. Is one to show the real reserve? It is dangerous, so the administration believes.

The party has given us an example of the candid and impartial analysis of mistakes of the past. The improvement of the innovation movement and the elimination from it of ostentation, showiness, the imaginary mass nature, and the indicators of pseudo-competition, which were invented by someone and are in no way connected with the logic of life, can be accomplished only on one condition—if the matter of future technical creativity in the country becomes truly a concern of each of us, inventors and efficiency experts.

Where is the main thrust in innovation today? My experience as a worker and efficiency expert suggests: in the solution of the problem of introducing technical innovations. It is by no means new. I once went through a file of the journal IZOBRETATEL for 1930 and was amazed: the same questions, the same problems, and among them the main one is introduction! It turns out that for many decades society simply could not settle the primary question of technical progress: Does it need the results of creative research? I will not go now into the

causes of such a situation—this is a complex question. I will speak about another thing: today a way out of the deadlock is visible in cost accounting.

Why is it difficult for me, like many colleagues who are innovators, to introduce an innovation? In order to prove its utility, a demonstration is necessary. It is possible to do this only if there is an opportunity to produce a prototype and to test it. It is best to persuade a manager, who is obliged to make decisions, by showing the innovation in action. Modern innovation with minor exception lacks this opportunity due to the absence of an experimental base. Individual sections, brigades of introduction, and even creative laboratories of innovators, which were set up by the efforts of the councils of the All-Union Society of Inventors and Efficiency Experts, trade union committees, party organs, and managers of works, who think most in terms of the future, on the whole were not what counted. They could not solve the problem of introduction completely, constantly coming up against the problem of financing, supply, support, and staffs. Take, for example, the public design bureau at our plant. Their establishment came into fashion—they did something and reported back. "We are not such inveterates!" How did the matter end?

The experienced designers and process engineers, who were united into a collective, which could have become a creative one on certain conditions, too quickly lost all interest in this public formation. Without an experimental base the activity of the public design bureau became, obviously, pointless. Moreover, the work of top-level specialists was not paid for in any way—instructions and directives of financial organs stood in the way. It was necessary in a roundabout way to find some assets for the payment of bonuses to these enthusiasts. Wherever the cost accounting principle was violated and work was of an ostentatious nature, public activity in the sphere of innovation did more harm than good, discrediting the very essence of technical creativity.

Today opportunities to introduce cost accounting in innovation and to solve the problem of the development and, in many cases, the introduction of technical innovations are appearing. Such an opportunity appeared with the emergence of inventors' cooperatives. They are boldly solving many difficult production problems by means of the technical innovations developed by them. There is a broad field here for the innovator, there is a place to apply one's talent. Temporary creative collectives are also affording great opportunities for innovators. They can bring together like-minded people from various fields of knowledge and high class specialists, alongside whom young people will obtain the opportunity not only to become familiar with creative work, but also to increase their occupational level. The opportunities are enormous—if one knew how to profit by them completely.

Why have I begun to speak about young people? I have been observing with a heavy heart that there are fewer and fewer young people who want to become metal

working specialists. The acute shortage of tool makers, mechanics, and lathe operators is occurring due to the fact, in particular, that in our city there is no vocational and technical school which would train young people in such very scarce specialties. Why has the labor of metal workers become not that prestigious? I believe that, besides poorly organized promotional work, it is also a matter of the remuneration of this labor. Years and experience are needed in order to rise to the heights of an occupation. Innovation could become an important stimulus of the mastering of the occupation of metal worker—here there are both particular interest and additional material stimuli, the opportunity to assert oneself

and to show one's worth in work. All this is very important for young people. However, for this it is necessary that a special moral climate around technical creativity would be created in the collective.

In short, very many problems have accumulated around innovation. It is clear that it will not be possible to solve all of them at one stroke. But it is necessary to start working on this. I believe that the 7th Congress of the All-Union Society of Inventors and Efficiency Experts will be of great importance here.

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Umirzak Makhmutovich Sultangazin

18140261b Alma-Ata VESTNIK AKADEMII NAUK
KAZAKHSKOY SSR in Russian No 3, Mar 88 pp 4-5

[Article under the rubric "The Session of the General Assembly of the Kazakh SSR Academy of Sciences": "President of the Kazakh SSR Academy of Sciences Academician of the Kazakh SSR Academy of Sciences U. M. Sultangazin (Biographic Information)"]

[Text] Academician of the Kazakh SSR Academy of Sciences Umirzak Makhmutovich Sultangazin, born in 1936, a Kazakh, and a CPSU member since 1968, was born in the settlement of Kara-Oba of Uritskiy Rayon of Kustanay Oblast in the family of a kolkhoz farmer. In 1953 he graduated from the secondary school of this settlement and in the same year enrolled in the Physics and Mathematics Faculty of the Kazakh State University imeni S. M. Kirov. In 1958 U. M. Sultangazin graduated with honors from the university and was kept as an assistant lecturer of the Chair of Differential Equations. In 20 years of work at the Kazakh State University, U. M. Sultangazin covered the path from assistant lecturer to professor and corresponding member of the Kazakh SSR Academy of Sciences. All these years he successfully combined fruitful teaching activity with intense scientific work. He defended his candidate dissertation in 1966 and his doctoral dissertation in 1972. From 1978 to the present, he has been director of the Institute of Mathematics and Mechanics of the Kazakh SSR Academy of Sciences. For a large contribution to science, U. M. Sultangazin was elected in 1975 a corresponding member of the Kazakh SSR Academy of Sciences and in 1983 an academician of the Kazakh SSR Academy of Sciences; from January 1985 to June 1986, he was academician secretary of the Physical and Mathematical Sciences Department and in June 1986 was elected vice president of the Kazakh SSR Academy of Sciences.

The works of U. M. Sultangazin made a substantial contribution to the development of the mathematical problems of kinetic transport theory. He proved the local and global theorems of existence and uniqueness for nonlinear discrete Boltzmann equations. The theoretical research on symmetric systems of hyperbolic equations contributed to the further study of the development of the method of spherical harmonics, which is of great theoretical importance in the design of nuclear reactors and the calculation of the spread of radiation in the atmosphere. The 1987 USSR State Prize in Science was awarded to U.M. Sultangazin for a series of works on the mathematical theory of the transport of particles, which was completed over the past 20 years.

While managing the Institute of Mathematics and Mechanics U.M. Sultangazin did much work on the improvement of the scientific organizational activity of

the institute and the mobilization of the collective for the solution of urgent problems of a basic and applied direction in mathematics and mechanics. He is an active organizer of the development of computational and applied mathematics at the Kazakh SSR Academy of Sciences. The Collective-Use Computer Center, which is the basis of the intensification of the use of mathematical methods in various sectors of the national economy, was established under the direct supervision of U.M. Sultangazin. The scientific gains of the collective, which have been made in recent years, have brought it to the forefront of domestic and world science. Starting in 1981 the institute constantly took first places in the socialist competition among institutes of the USSR Academy of Sciences and the Kazakh SSR Academy of Sciences.

The pedagogical activity of the scientist has received recognition abroad. U. M. Sultangazin has given lectures at Charles University (Prague), as well as at the Paris Institute of Automation and Cybernetics and at the Banach International Mathematics School in Warsaw. In conformity with a program of international cooperation, during 1978-1979 he took part in scientific research work on differential equations at Stanford University and the University of Maryland of the United States.

Being the author of more than 100 scientific works and inventions and 4 monographs, U.M. Sultangazin is making a large contribution to the training of highly skilled personnel.

U. M. Sultangazin is performing much public work and is chairman of the republic Federation of Astronautics and president of the Small Academy of School Children. He is the initiator of the establishment of the Intersectorial Kazakhstan Center for the Receiving and Processing of Space Information for the Solution of National Economic Problems of the Republic.

U. M. Sultangazin is devoting much attention to the promotion of scientific knowledge in the republic, permanent republic and city scientific seminars on current problems of computational and applied mathematics have been organized by him.

U. M. Sultangazin is a deputy of the Kazakh SSR Supreme Soviet, 11th Convocation, and a member of the Commission of the Kazakh SSR Supreme Soviet for Science and Technology; his services have been commended by state awards: the Order of Labor Red Banner, two Honorary Certificates of the Presidium of the Kazakh SSR Supreme Soviet, and the S. P. Korolev Medal.

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